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General Articles

TUBERCULOSIS IN THE DOG*

I.—From the Clinical Aspect

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In committing to paper a description of a disease in which the symptoms are not constant but very varied, presenting a great diversity in their clinical manifestations and possibly involving every tissue in the patient, one might fill a volume. The Fellows present this evening, however, need feel no alarm; it is fully realised that when speaking to a learned audience, only the salient features need be emphasised, more especially to serve as a basis of discussion.

The incidence of tuberculosis in our canine patients varies largely according to environment; thus, in big cities it is more prevalent than in provincial towns and country districts. When one considers the possible sources of infection, the explanation becomes obvious. It has been recorded that the number of cases presented at the Out-patients' Department of the Royal Veterinary College, over a period of two-and-a-half years, ranged from 0·3 to 0·4 per cent. of the total number of dogs submitted to treatment. This figure is much lower than that reported from Alfort and other continental centres of veterinary science. Provincially, the disease is rarer but in the country odd cases are encountered in the course of practice. One is able to associate the source of infection in many of these cases with direct contact with persons who admit that they are tuberculous, but cases are also met with where the owner makes no such admission. It follows that dogs, where the normal habitat is a public place, such as a public saloon or restaurant, sometimes contract the disease by one of the three possible routes of infection, the actual source being the dried or moist expectorate from an infected human being. In a similar manner butchers' dogs may get access to infected meat or offal, for even in these days public health regulations regarding meat are non-existent in many rural areas.

Milk is also a possible vehicle, especially in puppies fed on raw cow's milk.

One may doubt whether tuberculosis is ever a naturally-occurring disease in the dog in its normal state, and formulate a theory that it is always acquired directly or indirectly from direct or indirect contact with infected people or food. Rarely, it may be contracted from another dog when kept in close confinement, as in kennels.

General Symptoms.—The recent case of tuberculosis in the dog presents difficulties in diagnosis in that there may be no leading symptom, and the general symptoms are those which characterise many diseases. The owner may complain of a lack of vigour in the dog, the animal becoming easily fatigued. A capricious appetite and some loss of flesh may be evident. Generally, this type of case soon merges into the graver and more common type. Here the symptoms present a great diversity in character, but generally they can be grouped according to the pathological changes. Thus individual cases fall under the main headings—pulmonary, abdominal, visceral, arthritic, local and generalised. Whilst in some of the cases a subsequent *post-mortem* examination will show that the lesions were confined to one organ, or group of organs, more commonly evidence is afforded that the disease is steadily progressive and that infection has spread from one of the great cavities to the other, or to more distant parts of the body, or has become generalised.

The Facies of Tuberculosis.—It becomes a habit in canine practice to place the left hand on the cranial vault in order to examine the accessible mucous membranes. What immediately strikes the tactile sense is the loss of tissue in the temporo-orbital region. The fat has disappeared, the muscles are atrophied, and the bony crests unduly prominent. One is also struck by the expression of anguish in the dog's eyes.

To those who have paid especial attention to this disease the facies is almost characteristic, but in a large measure it is reproduced in the cachexia associated with advanced malignancy. Concomitant symptoms are emaciation, the dorsal spines and ribs standing out prominently. Alternately, the facies may exist with a moderately well-nourished body.

The thermal reaction is of little value. Intermittent or remittent in character, it varies from hour to hour. Elevated in pulmonary cases, it becomes subnormal in advanced cases.

*Papers presented in opening a discussion on this subject at a meeting of the Central Veterinary Society held at the Conway Hall, Red Lion Square, W.C.1., on May 7th, 1936.

Thoracic Tuberculosis.—The thoracic cavity is more commonly the primary seat of infection, but lesions here may be secondary to those elsewhere. The symptomatology of pulmonary tuberculosis of the dog is a treatise of every disease which may affect the organs contained within the thoracic cavity. Cough is not necessarily evidenced and may sometimes be absent, even in advanced cases where both pulmonary and cardiac tissues are involved. Usually present, however, it shows a marked diversity in its character, ranging from short and husky to paroxysmal, accompanied by strange noises and followed by marked retchings. The character of the respiration will vary from the normal in pleurisy, pericarditis, when marked tuberculous deposits are present in lung tissues or on the chest wall and diaphragm, and when effusion of fluid has occurred. In these conditions pain is present and a painful area will lead to fixation of that area and a compensatory increase in the work performed by some other parts of the lung. It follows that the thoracic and abdominal respiratory movements may not co-ordinate, and that abdominal respiration may be increased and the thoracic diminished or non-existent. Hydrothorax may lead to an asymmetrical bulging of the chest wall, and to syncopal attacks. Percussion of the chest is not of much service, especially in long-haired dogs, but on the other hand, the stethoscope is invaluable. If one considers the nature of the onset of the disease, *e.g.*, the introduction of the *B. tuberculosis* and the reactionary phenomena of congestion, consolidation, softening, cavitation, or alternately sclerosis, one may appreciate the variation in lung sounds.

Additionally, pleuritic sounds, dry and moist, pericarditis with enormous papillomatous-like deposits on the heartwall, and dropsy on the pericardial sac, complicate the picture. Rhonchi and râles may be detected, and areas of dullness are easily noted. Breaking down of lung tissue, causing moist clicking râles and increased tubular breathing, and the post-tussic suction of air rushing into a cavity may be emphasised by inducing coughing through compression of the larynx. Pleuritic sound may be uni- or bi-lateral; fluid leads to absence of sound below the fluid level, and a splash may be heard, especially if the body is swayed. The friction sounds of pericarditis do not correspond with respiration and persist if respiration is momentarily arrested. The heart sounds may be obliterated by a mass of new tissue formation.

Abdominal Tuberculosis.—Here, once again, one meets with a great diversity in symptoms. Diarrhoea, frequently blood-stained, indicates involvement of the alimentary tract, and probably bowel ulceration. Usually this type of case presents a degree of emaciation and the vertebrae and ribs are too prominent. The ribs overlying the liver are often unduly prominent, indicating an enlarged liver. This organ is frequently involved and has often been found to be the only abdominal organ affected in the thoracic type of case. Since the tuberculous outgrowths in the liver may assume large proportions, they may often be detected by palpation of the abdomen and frequently give rise to errors in diagnosis. Ascites is usually present, but generally the amount of fluid is very small. Occasionally the abdomen becomes pendulous owing to the exudation of a large quantity of fluid. The omentum and mesentery are often involved, and become thickened and nodular, and sometimes tumefied. The kidneys are occasionally involved throughout their substance.

Localised Forms.—Tuberculosis affecting the eyeball appears to be far less common in canines than in felines. Iritis, choroiditis and amaurosis of one or both eyes may occur. In the pharyngeal region and various other areas in close proximity to a lymphatic gland, sinus formation accompanied by a glairy or purulent discharge may be observed. Similarly, areas of skin may undergo a necrosis resulting in an indolent ulcer with granular base, and having little tendency to heal. The various superficial lymphatic glands may become enlarged; more commonly an isolated gland is observed to be enlarged and indurated; rarely a chain of glands is involved. Bone lesions are not uncommon. Sometimes the condition is confined to one bone, such as the femur or tibia, but more often much of the skeleton becomes implicated, such as the vertebrae, pelvis, long bones, the small bones of the joints, and digits. The condition is one of chronic osteitis and periostitis. The observable symptoms are lameness, pain on pressure, enlargement and a spongy feel on palpation.

Infection of the central nervous system may occur, lesions being present both in the brain and spinal cord. The nature of the disease in these situations will only be diagnosed when the presence of a tuberculous infection in some other part of the body has been ascertained.

Diagnosis of Canine Tuberculosis

The facies of tuberculosis is a clinical indication which appears to be constant in this disease in the dog, and although it may be largely reproduced in certain other diseased conditions, it materially helps in that it creates suspicion in one's mind as to the possible ailment. The wasting of the tissues lying between the zygomatic processes and the occipital crest is always a symptom of serious import in canine subjects. Seen in young dogs in certain advanced forms of virulent distemper, and some of the less common forms of parasitism, it is met with in older subjects in association with

the cachexia of malignancy, and to a lesser degree in advanced nephritis. The ocular expression appears to be reproduced only in advanced malignancy. In early cases, the general symptoms are by no means diagnostic, and in advanced cases the clinical symptoms afforded, whether they be cardiac, pulmonary, alimentary, abdominal or locomotory, are very apt to be confounded with the symptoms presented by other pathological conditions. Many mistakes in diagnosis have been, and no doubt will be, made, even by experienced clinicians, and error is facilitated by the comparative rarity of the complaint, and by the great diversity in the symptoms. In certain instances tactful enquiry into the family history of the owner will elicit the fact that tuberculosis exists in one of the members of the household, and often, when such information is not forthcoming, one is doubtful of the husky cough and troublesome chest of the patient's owner. Discharge from chronic ulcers or sinuses; pleuritic or ascitic fluid, when obtainable, or samples of urine centrifugalised and appropriately stained, may show acid-fast bacilli. Numerically, tubercle bacilli show a wide divergence in different lesions, and, whereas one may fail to detect their presence in one lesion, elsewhere they may be present in large numbers; their absence, therefore, is not necessarily a true indication.

Of the tuberculin tests, the ophthalmic, the endermic and intradermic are useless when the tuberculin used is of bovine origin. Whether the intradermic would be of value with a tuberculin prepared from bacilli of canine origin requires research. The subcutaneous test is very valuable and gives a high percentage of correct results. A difficulty sometimes arises in that the temperature of the dog is so elevated that any thermometric test is rendered impossible. This febrile condition is more often met with in the pulmonary type of infection, and it has been found that if a dog is kept at rest for several days the temperature readings usually assume their normal level. It is desirable to obtain the temperature readings for a day or so before the test and it has been established from experience that the hours of 8 a.m., 2 p.m. and 6 p.m. are the most suitable. The pre-injection chart then serves for purposes of comparison with the post-injection chart. One then administers the tuberculin at 8 a.m. and obtains the temperature reading every second hour throughout the day. Fewer temperature readings are unsatisfactory, as the temperature curve rapidly rises and falls, more especially during the fourth and tenth hour after the administration of tuberculin. During the first few hours a fall in the temperature may be noted, then a sustained rise, mounting to a peak or a plateau, followed by a steady fall, is indicative of tuberculosis. The temperature records of a number of cases have been averaged, and these constitute a typical reaction.

Average pre-injection temperature 101·7°; dose of tuberculin of bovine origin, 1 to 1·5 c.c. subcutaneously at 8 a.m.—average temperature readings: 8 a.m., 101·9°; 10 a.m., 102·0°; 12 a.m., 103·0°; 2 p.m., 103·5°; 4 p.m., 103·5°; 6 p.m., 102·8°; 8 p.m., 102·25°; 10 p.m., 102·0°.

Many affected dogs, a few hours after the injection of tuberculin, appear extremely ill, dejected and disinclined to move. This malaise, in conjunction with the clinical symptoms, affords valuable confirmatory evidence of the presence of tuberculosis. Very advanced cases may yield no thermal reaction, but their dejection is especially well-marked.

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Incidence.—The dog appears to be a particularly resistant subject to tuberculosis. In the past three years at the Beaumont Animals' Hospital, only 23 positive cases of tuberculosis have been met, forming 0·15 per cent. of the total number of dogs examined, and the following remarks are based on these cases. Smythe, however, in 1929 records an average of 0·3 to 0·4 per cent. of cases in the same clinic, while Dr. A. Stanley Griffith in 1907 found that two out of 104 dogs used for experiment by the Royal Commission on tuberculosis were affected with the disease.

Susceptibility. *Age.*—It is noticed that animals are most susceptible to infection between two and seven years old. Young puppies do not appear to be susceptible—the youngest dog found to be tuberculous was ten months old—neither is it a disease of the very old dog, and no cases were seen in animals over nine years.

Size.—Size also appears to play some part in determining susceptibility, for in the 23 cases under review, eleven have been dogs under 25 lb. body-weight, and twelve dogs of the Alsatian or retriever type, normally weighing in the region of 60 lb. The big dogs form the smaller proportion of animals examined in the hospital, and thus larger dogs appear more highly susceptible. No cases were found among the toy breeds, such as the Peke and the Pom, although such dogs live in close contact with their owners.

Source and Type of Infection.—Stableforth in 1926 recorded a series of 16 cases where he had typed the organism, and of these ten were of human and six of bovine origin. In this series none of the organisms was typed, and in two cases only has there been a history of

contact with a person known to be tuberculous; in one the owner had died of tuberculosis three months previously and in the other, the owner had a tuberculous cough. Owners, however, are naturally reluctant to reply to questions concerning their own health.

Milk does not appear to be a potent source of infection. Adult dogs do not receive large quantities of milk, and puppies which are the largest consumers of milk are rarely affected. In London the greater proportion of milk is pasteurised, and it will be interesting to hear the opinion of those treating dogs in districts where milk is not pasteurised.

Course.—Acute and subacute forms are more common than the chronic type. The average course covers about one month; 19 cases have been seen where illness lasted up to one month, and only four cases lasting longer than one month. The most acute case had a history of three days' illness, while eight dogs were perfectly normal 14 days prior to inspection, which were acutely ill at the time of inspection.

These acute cases are generally thoracic in type, the abdominal form may be much more chronic; one case with tuberculosis of the mesenteric lymphatic glands lived for twelve months from the onset of symptoms. In addition to the 23 cases quoted, in 1931, two more chronic cases were examined, one of three months' duration where the ileo-colic gland was affected, the other of eight months' duration where the mediastinum was affected.

Distribution in the Body.—The thoracic form is by far the most common, and lesions may be entirely confined to the chest, as was seen in five cases, whereas in only one case the lesions occurred only in the abdomen, and of the generalised cases, eight showed more serious lesions in the chest than elsewhere. In one case the testicles formed the primary site of infection, the dog having an extensive orchitis with secondary lesions in the iliac lymphatic glands and the lungs. Smythe also records cases of localised tuberculosis in the bones or pharyngeal glands.

Symptoms. *Thoracic form.*—This is usually characterised by the development of a copious pleural or pericardial exudate which produces almost diagnostic symptoms of respiratory distress. There is a preliminary period of malaise when the dog is dull, having a variable appetite and an increased thirst, but vomiting and diarrhoea rarely occur. It loses flesh rapidly, and the temperature is almost invariably raised from 102·5 to 106°. Respiratory symptoms develop in seven to 20 days, coughing may or may not occur and may be provoked by percussion, but it is not in any way characteristic. The respirations are increased in force and in number, up to 76 per minute, costal respirations become greatly exaggerated; in fact, this is one of the most characteristic symptoms. The amount of exudate present in the chest, often up to several gallons, necessitates the dog using every respiratory aid. Auscultation and percussion reveal a variable condition within the chest. If fluid is present on one or both sides of the cavity the chest is dull on percussion, which is painful, and the heart and breath sounds may be entirely lost. The heart may be deflected to the right side by the presence of fluid in the left. Where consolidation of lung tissue only occurs, corresponding areas of dullness may be detected. The heart is invariably distressed, its rate is increased to between 100 and 200 per minute, and the pulse may be full or small. From this stage the animal becomes rapidly worse and dies within ten to 20 days from the onset of respiratory symptoms.

Abdominal form.—In the abdominal form the preliminary symptoms are similar, but vomiting is more frequent and severe, sometimes resembling symptoms of intestinal obstruction, but diarrhoea is rarely marked. If the site of infection is the ileo-colic lymphatic gland, this can be palpated as an irregular nodular body, or the presence of tubercles in the liver may be palpated. Peritonitis with effusion frequently develops. The kidneys may be affected and the dog will show symptoms of nephritis, such as thirst, vomiting, and albuminuria. In one case the dog developed uraemic symptoms. Again the temperature shows an increase. These cases may continue for two to three months, and then the animal show signs of respiratory distress and later die from acute thoracic tuberculosis.

Diagnosis.—Smythe had investigated the use of tuberculin tests and his conclusion is that the subcutaneous test is the most reliable. In our series of cases the dog's temperature was frequently raised, from 102 to 106°, which precludes its use, and while a negative result is a good indication that the dog is not infected, a reaction to tuberculin is not, in our experience, an invariable indication that the animal is tuberculous. Cases have been met where a *post-mortem* examination on an animal giving a positive reaction to the tuberculin test, has revealed abscesses due to pyogenic organisms.

We place far more reliance on the demonstration of tubercle bacilli in the exudate from the abdomen or chest obtained by paracentesis. This fluid is almost invariably present, particularly in the later stages of the disease. In 19 of the 23 cases under review, fluid was present in one or both cavities, comprising 17 cases of pleurisy, seven of pericarditis, and five of peritonitis, all with effusion. Several gallons may be present. It is clear and straw-coloured, occasionally tinged by the presence of blood, while rarely is it purulent. It so resembles oedematous transudate that it is frequently confused with it.

Centrifugalisation and examination of smears of the deposit stained by the Ziehl-Neelsen method reveal the presence of numerous cells, chiefly large mononuclears and polymorphs, and a variable number of tubercle bacilli. This aspect will no doubt be dealt with by subsequent speakers.

Urine examination may be helpful where there are lesions in the kidneys. If the urine from a suspected case contains albumin it is probable that on microscopical examination, tubercle bacilli will be found. In such cases *post-mortem* examination has revealed miliary tubercles in the kidneys.

Differential Diagnosis.—The subject of diagnosis cannot be adequately discussed without paying considerable attention to differential diagnosis. I would put the four most prominent symptoms of tuberculosis as being:—

1. A rise in temperature.
2. Dyspnoea.
3. Rapid loss of flesh.
4. Abdominal distention.

All these symptoms may, however, be associated with other diseases.

1. A rise in temperature is in the main due to one of three conditions, canine distemper, suppuration, or tuberculosis. *Canine distemper* is frequently confused with tuberculosis, particularly when it occurs in middle-aged dogs. The pictures of the thoracic forms of the diseases are very similar except that a bronchopneumonia is the lesion in the one and a pleurisy in the other. Coughing is more common in distemper than in tuberculosis. Diarrhoea is an almost invariable symptom in canine distemper, yet it is generally absent in tuberculosis. Finally, the development of chorea ataxia or epileptiform convulsions affords positive evidence of distemper infection.

Suppuration.—I am not referring to the more obvious sites of suppuration, but to the obscure ones, particularly suppuration of the ileo-colic lymphatic gland due to colon organisms, etc. This condition most closely resembles abdominal tuberculosis, but runs a more acute course, and is not associated with a peritoneal exudate. Secondary infection of neoplasms of the gland gives rise to similar symptoms.

Suppuration of liver, lungs and kidneys is extremely rare as a primary condition and when it occurs is generally a complication of neoplasia.

2. *Dyspnoea.*—In addition to canine distemper, which has already been dealt with, lymphosarcoma and carcinoma of the lungs may give rise to dyspnoea. They do not, however, in the early stages give rise to a systemic reaction or to pyrexia, or to a pleurisy with effusion, which is the most prominent lesion of thoracic tuberculosis.

Hydrothorax is, in my opinion, invariably due to tuberculous effusion, since microscopical examination of the fluid had always revealed tubercle bacilli.

Ruptured diaphragm is a rare cause of dyspnoea, but here there is a history of sudden onset of symptoms following a street accident, and radiography will show the presence of abdominal viscera in the thorax.

3. *Progressive emaciation of the middle-aged dog.*—This condition, which is often ascribed to tuberculosis, is in our opinion rarely symptomatic of that disease.

Chronic nephritis is by far the most common cause, but may be distinguished by its insidious course with frequent remissions. Excessive thirst, vomiting, and emaciation, not associated with pyrexia, are its outstanding symptoms. Urine examination is invaluable in enabling one to arrive at a diagnosis. The most significant features of the urine are: a low specific gravity and low albumin content, whereas in a case of tuberculous nephritis the urine is of a high specific gravity and high albumin content. The development of uraemic symptoms at the termination of the disease is diagnostic of chronic nephritis.

Lymphosarcoma of the small intestine and mesenteric glands and carcinoma of the liver are a not infrequent cause of emaciation, and on palpation may be easily confused with tuberculosis of the same organs. These cases are more chronic and are not accompanied by pyrexia, unless secondary infection occurs.

Chronic venous congestion of the liver and intestines, consequent upon heart disease either of the myocardium or valves, occurs in aged dogs, giving rise to chronic emaciation, the only other symptoms being vomiting and a most profuse diarrhoea, neither of which is a prominent symptom of tuberculosis.

4. *Abdominal distention.*—This may be due to tuberculous peritonitis, but this is one of the least common features of the disease. More common features are ascites consequent upon liver or cardiac disease, but the malaise and elevated temperature associated with tuberculosis are absent. Paracentesis and bacteriological examination of the fluid will provide positive evidence as to which condition exists.

In the bitch, pregnancy and pyometritis also cause abdominal distention. Careful palpation and consideration of the history of such cases distinguish them from cases of tuberculosis.

In conclusion, I should like to thank Professor Wright for his kind permission to use the material afforded by the cases observed in the Beaumont Animals' Hospital, and for his assistance in preparing this paper.

II.—From the Pathological Aspect

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In discussing the question of tuberculosis in the dog from the pathological aspect, one has to remember that these remarks of mine are based upon the records of routine *post-mortem* examinations and examination of specimens in the Department of Pathology at the Royal Veterinary College, and it is well to remember also that an analysis of the figures of tuberculosis in such a report may not give a true indication of the incidence of the disease in the dog population generally. There are several reasons why this is so: in the first place, as you know, many of these specimens and *post-mortem* examinations have come from the College clinic and as the staff there have already developed their technique for examining material under the microscope for tubercle bacilli, some cases do not reach the pathology department: secondly, permission to carry out a *post-mortem* examination is not always obtained. Thus, the number of tuberculosis cases which we get in the Pathology Department is less than those met with in clinic work.

With regard to the incidence, it is, I think, surprisingly low in view of the fact that tuberculosis is so very common in cattle and, of course, in human beings. There are, to my mind, two rather important facts about the disease. The first is the frequency with which other conditions are confused with tuberculosis on ordinary rough *post-mortem* examination. I refer in particular to the lymphosarcoma such as is found near the ileo-caecal valve. This was brought home to me forcibly a year or two ago, when I received a specimen of a "tumour" which had been removed from that site in the abdomen of a dog. On opening the animal, there were found a number of tumours one of which were sent up for section. I examined the specimen sent me by a direct smear from it, staining for tubercle bacilli, and was surprised to find that it was full of them. Had the practitioner who sent the "tumour" to the College not taken the trouble to do so, he would almost certainly have diagnosed the condition as one of neoplasia. I have an idea that that happens fairly frequently. The second important point concerning tuberculosis in the dog is that the lesions are totally different from those seen in cattle, a point I will refer to later.

With regard to the question of the organs most frequently affected, I propose to divide them into two main classes: in the first place, there is the thoracic type, and in the second place, there are those cases in which the disease appears to be primarily one affecting the organs of the abdomen, particularly the ileo-caecal gland. Acute tuberculous pleurisy is, I think, a very interesting condition, and one which until the last few years has not been recognised as such. It is rather noticeable, on going through the records of reports, that this condition is appearing more frequently than it use to do. On *post-mortem* examination in such cases one finds very definite pleurisy; the thorax contains, as a rule, large quantities of fluid which is usually clear, or only very slightly turbid. The condition shown by the pleura resembles the "grapes" one sees on the pleural surface in tuberculous pleurisy in cattle, but the grapes are very much more congested. The condition is usually confirmed by microscopical examination of the centrifuged deposit of some of the fluid. It is rather interesting to note that, as a rule in these cases, the number of tubercle bacilli is large. One customarily has no difficulty in finding them; moreover, the cells in the deposit are largely polymorphonuclear leucocytes, which one does not expect to find in tuberculosis.

With regard to the second type, if I may class it so, involving, as a rule, the abdominal organs, I can sympathise very much with the clinician in his attempt to diagnose the condition. Even on *post-mortem* examination one finds in many cases very great difficulty in deciding whether the condition is one of tuberculosis or whether it is one of a true neoplasm. The lesions occur, of course, in the lymphatic glands of the intestine, in the liver, and, depending upon the amount of spread, in the other organs as well—the spleen, kidneys, etc., and occasionally there is complete generalisation. Ascites may be met with depending on the degree of passive congestion present. On examination, the lesions are very much like tumours, fairly circumscribed and reasonably soft. The centre of the lesion may be almost uniformly white or in some of the older lesions one may find degeneration, but not the type of degeneration one sees in cattle; there is no caseation. When it does occur, the degeneration takes an almost floccular, pus-like form, and the condition might be mistaken for an ordinary septic infection.

Another difficulty in diagnosing these conditions is that it is sometimes very difficult to demonstrate tubercle bacilli by the ordinary microscopic test, and one has to resort to histological examination, and to the inoculation of guinea-pigs. The veterinary surgeon in practice has not, of course, the facilities of the laboratory close at hand, and he is accordingly limited, so far as diagnosis goes, to the preparation of smears, staining them, and examining them under the microscope. In these circumstances it becomes very difficult indeed for the veterinary surgeon to be sure of himself. Naked-eye appearances of tuberculosis and tumours are often very similar, particularly where

lympho-sarcoma is concerned. Histologically there are differences in that the tuberculous lesion is definitely a granuloma, whereas a sarcoma is definitely a true neoplasm. In the former one can detect typical cells of a chronic inflammatory nature, but one does not see caseation, nor calcification; moreover, the presence of giant cells, so characteristic of tubercle in other animals, is rare in the tubercle of the dog. Thus it follows that to be quite sure with regard to any case of this type, as to whether one is dealing with tubercle or neoplasia, it is necessary to examine the material histologically or to carry out biological tests with guinea-pigs.

These two types of tuberculosis, thoracic and abdominal, are, I think, by far the commonest types one meets with in the course of ordinary routine *post-mortem* examination in the dog. Whether the incidence of these is the same in practice as it is in *post-mortem* records is rather doubtful because of the fact that many cases which come into the clinic of the College are definitely diagnosed by the clinical people themselves and never reach the *post-mortem* department.

Occasionally—and in my experience very occasionally—one gets cases occurring in unusual situations and in situations where one does not expect to find tubercle and one is consequently thrown off one's guard. Recently we had a case of tuberculous mediastinal gland. The case is going to be reported fully in the *Veterinary Journal* by Dr. McCunn and Mr. Hickman, but I may say that I had this brought down to me and it showed a large tumour in the mediastinum, obviously originating in the mediastinal glands. It was oval in shape and was roughly the size of a cricket ball. It was white in colour, moderately firm, and, on section, it showed a circumscribed white centre with hardly any evidence of break-down at all. From its appearance I hazarded the opinion that it was a sarcoma, influenced by the fact that I could not recall having previously had a case of tuberculosis in that position in the dog. I may say, however, that Dr. McCunn and Mr. Hickman had diagnosed the case as one of tuberculosis. I failed to find tubercle bacilli by direct smears and I inoculated guinea-pigs with some of the material. The case turned out to be one of tuberculosis, which was a matter of considerable surprise to me.

One also, of course, gets cases of tuberculosis invading other unusual organs, generally, I think, secondary to tuberculosis in the abdomen or chest. We have had a case of tuberculosis of the prostate gland in which very large numbers of tubercle bacilli were found in the urine. Whenever one finds tubercle bacilli in the urine, therefore, one must not assume that it is necessarily the kidney that is involved.

With regard to differential diagnosis, from the *post-mortem* work I have done, I do not, as I have already said, rely on simple naked-eye examination. The conditions most commonly mistaken for tuberculosis are lympho-sarcoma affecting the ileo-caecal gland and also, though perhaps to a less degree, carcinoma of the liver. The third condition, but one which is not so likely to be mistaken nowadays, is the so-called Hodgkin's disease of the dog, particularly in the early stages, where the glands are just beginning to come up. Clinically, I think, the diagnosis there is quite definite; the condition is now a well-recognised clinical entity, but with regard to the other conditions I have mentioned, I should imagine that it is extremely difficult to make a definite diagnosis, without resorting to histological sections or animal inoculation.

To conclude, I think that tuberculosis in the dog is really surprisingly rare, that a final definite diagnosis cannot as a rule be made by naked-eye *post-mortem* examination alone, and that numerous other conditions can be readily mistaken for it; further that the only method of obtaining a definite confirmation of a clinical diagnosis is to find the tubercle bacillus. While in lesions of the thoracic type that is relatively easy, in the abdominal type it is extremely difficult. Possibly these two types are caused by different types of tubercle bacilli. I have the idea that the pulmonary type is caused by the human strain and the abdominal type by the bovine strain, but I have not sufficient evidence to make a definite statement. In any suspicious case one should always make a film and stain by Ziehl-Neelsen. One has to be on one's guard to avoid taking it for granted that a lump removed even from the skin is a neoplasm; it sometimes happens that the growth is actually due to tuberculosis.

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III.—From the Bacteriological Aspect

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Royal Veterinary College

The bacteriology of tuberculosis in the dog, like that of other animals or man, owes a great deal of its interest to the fact that there are three very well-recognised types of bacilli, *viz.*, the human, bovine and avian types, which are easily distinguished and which are mainly responsible for tuberculosis in the three species whose names they bear. Although these types do actually cause most of the tuberculosis in these three respective species, that does not mean to say that they are necessarily confined to them. The bovine type can produce tuberculosis in all species of mammals including man; the human type is virulent for man, the ape and monkey and the guinea-pig, but only of low virulence for the rabbit. Dogs can be infected with both the bovine and human types, but

have a high degree of resistance. All birds, except the parrot, are entirely resistant to both the bovine and human types. The avian type is virulent for all species of birds; it can also produce tuberculosis in rabbits, and, usually in a localised form, in the pig, sheep, ox and horse, and in certain wild mammals. The important point is, however, that these three types of tubercle bacilli are responsible for their maintenance to the three species whose names they bear. That is of considerable interest, because it means that when a certain type of tuberc'e bacillus is isolated from a lesion, it is possible to say with assurance where it originated. These types are stable. Were it not so, the isolation of a strain into particular characters would be of no significance. It has, however, been shown without any doubt that, apart from slight modifications in virulence in one or two well-recognised connections, these three types of tubercle bacilli maintain their characters when they are transplanted to other species. This was demonstrated by the Royal Commission and the evidence provided by that body and by others was reviewed by Cobett in 1917. Organisms of the bovine type have been put into birds, dogs and into cold-blooded animals and allowed to reside in them, either through a single passage or a series of passages, covering a period of one to eight years, and still the bovine type has maintained its bovine characters: similarly, the human type and avian type have been passaged in other species over long periods without change.

The existence of these stable and distinguishable types has a definite interest from the epidemiological or the public health point of view. We can get the bacilli from the human being and show, for instance, that the majority of cases of tuberculosis of the cervical or mesenteric glands in children must have come from milk, because the organisms which are obtained from the mesenteric or cervical glands have the exact characters of bovine bacilli: so we can classify these cases as definitely bovine in origin and take suitable preventive measures. Similarly, in cattle infection with avian bacilli has occasionally caused a reaction to tuberculin: it must have come from fowls. Again, a certain proportion of cases of tuberculosis in pigs are caused by the avian type of tubercle bacillus, showing the necessity of keeping pigs away from tuberculous fowls.

How do we distinguish these types? It was at one time said that one could distinguish them morphologically under the microscope. That is, however, now recognised as of little or no value. In culture, however, they are sharply distinguished; the bovine type of tubercle bacillus, *e.g.*, grows very poorly, making a sparse and nearly colourless growth and is not usually helped by the presence of glycerine in the medium; the human type produces, on the other hand, a much thicker growth usually pigmented, whilst the avian type produces quite large, almost paint-like colonies or growths which emulsify easily. On glycerine media, both the human type and avian type grow well, thus contrasting with the bovine type.

Their pathogenicity for various small animals —in particular, the rabbit, guinea-pig and fowl —is the second way of differentiating the various types. As already stated, the bovine type is very virulent for the rabbit and also virulent for the guinea-pig; the human type is virulent for the guinea-pig, but only slightly virulent for the rabbit. Neither is virulent for fowls. The avian organism is, to a certain extent, pathogenic for the rabbit, and not at all for the guinea-pig, but a very small dose suffices to produce tuberculosis in the fowl. Finally, the mammalian types may be distinguished from the avian by serological tests.

Before passing to the actual types found in the dog, I should like to confirm what Mr. Orr has said, *viz.*, that thoracic cases of tuberculosis in the dog can usually be diagnosed microscopically fairly easily, and also that tubercle bacilli are fairly frequent in the urine where infection of the kidneys has occurred—but that in the abdominal form, where these whitish tumours which he has described are frequent, it is practically impossible, in my experience, to find tubercle bacilli by microscopical examination, although they may be demonstrable afterwards by guinea-pig inoculation.

The usual method of isolation of the tubercle bacillus is to sow the suspected material directly on to egg medium if it is fresh, or, if it is not fresh or obviously contaminated, to treat it first with some agent, such as antiformin, caustic soda or potash or an acid which will kill contaminating organisms without seriously damaging tubercle bacilli. Guinea-pigs may also be inoculated. Pure cultures having been obtained, the organism can then be typed.

As we have already seen, the dog can be infected with either human or bovine organisms. It is thus in danger from both infected milk and from contact with human beings affected with phthisis. In this country, in 1909, Griffith examined two cases of tuberculosis in dogs, both of which were due to the human type, and in another case in 1928 he also found the human type; Wilson and Lovell reported a case of bovine infection in 1928. In 1929 I reported 16 cases which I had examined; in six of these the organisms were bovine and in ten human. Thus, out of the total cases examined in Great Britain, seven have been shown to be bovine in origin and 13 human. On the Continent, a total of 32 cases have been examined and reported, of which 24 were bovine and eight human. Lesbouyries, however, reports that tuberculosis is very prevalent in the dogs of Paris and the surrounding regions, and he says

that practically all the cases there are of human origin: he ascribes this largely to the infection of dogs in restaurants with human sputum. He puts the incidence in and around Paris at about 8 per cent., that is, very much higher than the incidence in this country, which is apparently something between one and three per thousand, and than the incidence reported from another part of France. The series of cases I have examined was not large, but I obtained no evidence that there was any striking association between the lesions and the type of infecting organism.

The dog, therefore, can be infected with either the human or with the bovine type, though he is strongly resistant to both. The type he gets is thus largely a matter of chance depending on the source of infection to which he is exposed, tuberculous milk containing bovine bacilli or contact with human beings or material, that is, the human type of tubercle bacillus.

Reference

Stableforth, A. W. (1929.) *J. Comp. Path. and Therap.* 42, 163. (Other references given in this article).

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Tuberculosis in the Dog

Cases typed

	Bovine.	*Human.*	*Avian.*	*Total.*
English:				
Royal Commission				
A. S. & F. Griffith (1909)	–	2	–	2
A. S. Griffith (1928)	–	1	–	1
Wilson & Lovell (1928)	1	–	–	1
Stableforth (1929)	6	10	–	16
	7	13	–	20
Other Countries:				
Schornagel (1914)	2	6	–	8
Rabinowitsch (1921)	1	18	–	19
Malm (1912)	5	–	–	5
	8	24	–	32

* * * * *

GENERAL DISCUSSION

Mr. A. Cornish Bowden, when called upon by the President, observed that he was afraid that he could add very little to what had been said: he came there to learn some facts about tuberculosis in the dog, and he hoped he had been able to assimilate a little knowledge.

There was one thing about which he would like to have heard a little more, and that was tuberculosis of the bones. It so happened that he had recently seen several cases of acute lameness in the dog in which there appeared to be definite enlargement of the bones. He had taken them to a first-class radiologist who, after two cases of osteosarcoma, pointed out, in a similar case, the differential diagnosis between tuberculosis of bone and the malignant disease.

Contrary to what was said by one of the previous speakers, in a case of tuberculosis of the head of the femur which he had had recently, there was no pain on manipulation, but there was persistent lameness. X-ray examination revealed the eating away of the head of the bone. Certainly the photographs shown there that evening were very different from those he had in his possession, but the chief point was that with the osteosarcoma there was considerable pain on handling, but with the tuberculous head of the femur there was none.

That brought to his mind a case he had two years ago which proved to be a case of tuberculosis of the bone: there was no pain on manipulation in that case.

One thing which he had hoped to learn that night was how the infection arose in a case that was proved to be a tuberculous lesion in a single joint in the dog. He put that question to the radiologist, who said that one met with the same condition in children, in which there occurred tuberculosis of the hip or of the spine—quite isolated. Similarly, in the acute cases he had had that had definitely been proved to be cases of tuberculosis, there had been no secondary lesions anywhere.

He would like to have more information as to the mode of infection of the dog with tuberculosis and, in particular, to hear other members' experience in connection with tuberculous bone lesions.

Mr. F. H. Stainton felt that he must pay a tribute to the essayists that evening: he had come along to learn something, and he had certainly achieved his object. He was sorry to have to confess that the cases of tuberculosis in the dog he had discovered had usually been found on *post-mortem* examination or by accident, and he thought they had heard some very valuable facts that evening in connection with diagnosis before death. It was, he thought, quite obvious from what they had heard from the speakers, that when they were confronted, in practice, with cases of hydrothorax or abdominal ascites—*i.e.*, the wasting dog—those cases usually died, and it was only by careful pathological examination afterwards that one discovered the reason for the wasting condition. He thought it rather disappointing that they had no definite and reliable tuberculosis test for the dog. He had no doubt, from what they had heard from at least two speakers, that they would get one eventually; he thought that at any rate, they ought to know a good deal more about tuberculosis in the dog within a reasonable period. As he had said, however, he had come there that evening feeling that although he saw, he supposed, thousands of dogs in a year, his knowledge of tuberculosis in the dog was very limited. He had been happy in the thought that it was very rare, but now he wondered if it was so rare as they had been content to think.

Professor J. G. Wright said that he had little or nothing to add to the discussion, because his views were substantially in agreement with those expressed by Miss Oyler, with whom he had been working. If he might be allowed to do so, however, he desired to lay stress on certain features of her paper. As Miss Oyler had pointed out, tuberculosis was much more common in dogs between three and seven years of age, and in the large than in the small dog; in fact, one might go so far as to say that if a large dog, such as the Labrador, retriever or an Alsatian, was presented in an emaciated state, showing marked respiratory distress, it was almost certain that that dog was suffering from tuberculous pleuritis. He agreed that great reliance could be placed upon a rise in temperature. In fact, when a dog was presented with a rise in temperature they reviewed it under one of three headings:

1. Canine distemper.
2. Local sepsis.
3. Tuberculosis.

One point in regard to differential diagnosis—there was a disease which was quite common in middle aged and aged dogs the typical symptoms of which were those of a progressive emaciation associated with an uncontrollable diarrhoea. It was primarily associated with cardiac weakness and the symptoms were due to chronic congestive disturbances of the liver and intestines. On *post-mortem* examination the appearance of the small intestines was quite typical; they had a velvety appearance and the mucosa was raised up rather like the pile of a carpet. As he had said, the condition was primarily a heart disease, but it was generally diagnosed as enteritis.

Dr. J. R. M. Innes, of Cambridge, said that he was a guest and desired to thank the Chairman for the opportunity given to reply, and hoped that no offence would be taken if some of the remarks were blunt. A discourse from the clinical, bacteriological and pathological aspects had been given but one waited in vain to hear any mention of one of the most important problems of tuberculosis, namely, its pathogenesis. Ostensibly no facts had been presented by the speakers which were not already known and the general gist of the papers showed that no attention had been paid to substantiated facts concerning the pathogenesis. Many present might imagine from what had been said by the original speakers that tuberculosis was no different from any other disease inasmuch as a bacillus entered the body to cause some lesion or other and that was the end of the story, whereas the disease was almost unique, a point often forgotten by a tendency to think of the disease in terms of bacteriology, immunity and the tuberculin test. The remarks which he made were partly based on the results of a large series of post-mortems carried out in dogs and partly due to study in Pathological Institutes in Germany. No claim was made, as far as the disease in the dog was concerned, that his observations were original; they merely confirmed the work of Nieberle in Germany and much was taken direct from the monumental work of Nieberle. No speaker that evening had made one single reference to that work and many present might be unaware how much we were indebted to the German school of pathology for the knowledge concerning tuberculosis in man and animals. Nieberle had studied extensively the pathology and genesis of the disease in all domesticated animals, utilising existing knowledge concerning the disease in man.

"Probably the crux of the whole problem," proceeded Dr. Innes, "lies in answering the questions, how does the bacillus enter the body, what does it do and how does it spread? The tubercle bacillus is unique inasmuch as however it enters and wherever it spreads, it leaves a trail behind. Another question to be answered is, how does the disease in the dog compare with that in man and other domesticated animals? It is therefore necessary to recognise, firstly, certain irrefutable facts about the disease in man. The common pulmonary tuberculosis of the adult is not the first manifestation of disease in the individual concerned. In nearly every person a primary infection, confined to certain sites, occurs in infancy but the lesions heal, leaving a group of calcified lesions, characteristic in many ways and recognisable years afterwards. In a very small percentage of cases the lesion may not heal and the child dies from its primary infection. In others the bacillus may spread through the body by the blood and lymph stream. In children we are therefore dealing with primary infection and post-primary generalisation to distant organs. In the adult, phthisis is the result of a reinfection of an individual infected years previously. Whether this reinfection is from within, that is from a breakdown of a focus derived from the primary infection, or an actual superimposed new infection from without is not settled. Probably both are implicated. The main sources of primary infection in the human are the lungs and intestines, and in a small percentage of cases the pharynx, middle ear and skin—the latter can be discarded from this discussion. In all these situations the same sequence of events occurs subsequently to the entry of the bacillus and the lungs are taken as an example. A lesion occurs at the site of entry, is never multiple, is always subpleural and undergoes healing by fibrosis, hyalinisation, calcification and if seen years later may be ossified. The bacillus spreads to the regional lymph gland where the lesion produced also heals and calcifies. The lesion in the lungs, known as the Ghon lesion, together with that in the lymph gland, forms the so-called primary complex of German workers. In the case of the intestine the primary lesion may be very minute and not found, but the presence of an isolated lesion of any of the regional glands is conclusive proof that the bacillus has taken this path of entry. In some cases early spread takes place *via* the blood stream from the primary focus, and chronic destructive lesions occur in such organs as the bones, kidneys, testis, Fallopian tubes, brain and adrenals. Generalised miliary tuberculosis must not be confused with these lesions produced by the bacillaemia which occurs in this generalisation stage. In later life some individuals who have already passed through these stages are reinfected and the predominance of the pulmonary disease overshadows all others. An adult receiving infection for the first time, on the other hand, reacts in a similar way to the child. The disease in the human can be summarised, therefore, as taking the form of a primary infection, post-primary generalisation, to distant organs, and reinfection in later life. Much of importance has been omitted but it is sufficient to ask, how does this compare with the disease in the dog? From Nieberle's work it can be answered, only as far as that in early life is concerned, *i.e.*, primary infection and early generalisation.

"That tuberculosis is relatively rare in the dog is undoubted, but the failure to find any great percentage of old healed primary lesions either in the respiratory or alimentary tract in my own series of post-mortems indicates that the dog is but rarely infected, in contrast to children. Further, when infected, early spread and generalisation is the rule and not the exception as in children. The paths of infection in the dog are the same as in the child, *i.e.*, in the majority of cases through the lungs or intestines. From Nieberle's work infection by inhalation appears to be the more common mode. The rare occurrence of primary infection in sites such as the skin and vulva recorded in the calf has not been described in the dog. As in the child, primary infection of the lungs causes a lesion in this organ with spread to the regional lymph node (Primary complex). According to Nieberle this may heal but spread generally occurs by (*a*) aspiration into adjacent parts of the lungs, (*b*) the blood stream, (*c*) the lymph stream and (*d*) direct extension into pleural cavity. The last mode of spread is common, with the production of lesions on the pleura, pericardium

and arch of aorta. The subsequent spread of the disease from the lungs to distant organs is similar to the early generalisation in children, that is by a mild bacillaemia and the setting up of isolated destructive foci in such organs as the kidney, liver, prostate, testis, etc. If the lesions are active and progressive the dog thus dies from the primary infection and there is no stage of the disease directly comparable to phthisis in the adult man, or woman. When there is disease of the pleura, pericardium, peritoneum, meninges, it must be stressed that in every case it has arisen from the breakdown of a pre-existing focus in the neighbouring viscera, or in the case of the meninges, the brain.

"The case referred to by Miss Oyler as one of primary tuberculosis of the testis can hardly be correct and is, in fact, untenable; I would suggest that the testicular lesion was an example of blood stream infection arising from a primary focus elsewhere, in the alimentary or respiratory tract. Similarly, the statement of Mr. Cornish Bowden that he had observed isolated bone lesions in the dog, is quite untenable. The lesions mentioned—a type of hypertrophic osteoperiostitis—have been observed many times in the dog. He quoted a radiologist as saying that the same lesion occurred in children (*i.e.*, as a primary infection); this is incorrect and I refer him to any authoritative work. Although a number of lesions occur in organs distant from another and from the primary focus it is not correct to regard them as examples of generalised miliary tuberculosis; in fact in the dog, the latter is comparatively rare. There is no time to do more than mention that the primary lesions of the dog show a great tendency to slow tissue necrosis, an absence of calcification; the picture of the classical tubercle is conspicuous by its absence. In those cases where infection takes place by the intestines the primary lesion may not always be found, the regional lymph gland alone being infected. The subsequent spread, however, does not differ fundamentally from that occurring from the lungs."

Dr. Tom Hare said that he rose without contrition as a pathologist (laughter), but with modesty before a company of distinguished clinicians, to contest the thought that pathology had a great deal to teach the clinician in the rather dogmatic manner of the last speaker. He hoped his clinical colleagues would bear with him if he just referred to one or two of the statements made.

He wanted to ask Dr. Innes how he interpreted in English—in simple English—the fact of finding a dog, on *post-mortem* examination, with only a single lesion of tuberculosis. Were they to regard that as a primary lesion or what were they to regard it as? He was not taught in Germany; he was taught in England, and his teachers led him to assume that such a lesion was to be regarded as the primary lesion. He was going to instance a few cases of primary tuberculous lesions he had collected for the Museum of the Royal Veterinary College. Professor Wooldridge would remember one of several cases in which tuberculous tonsillitis was the only abnormality found on *post-mortem* examination of the dog. How did the tubercle bacilli get to the tonsils? He believed it correct to say that the animal was suffering from *primary* tuberculous tonsillitis. Furthermore, he had some cases of *primary* tuberculous aortitis, and he did not find tuberculous lesions anywhere else than in the aorta. He had two cases of *primary* tuberculous meningitis. One of them was brought in by a clinician who had diagnosed the case as distemper meningitis—and it was a good diagnosis too, because tuberculous meningitis attacked, as its primary site, the inferior and lateral surface of the brain; there was no other lesion of tuberculosis in that dog. He had still another instance of an interesting primary site, and that was *primary* tuberculosis of the suprarenal gland. He was quite prepared to believe that Mr. Cornish-Bowden's radiologist was probably right. Primary tuberculosis of the head of the femur was certainly very unusual, but it did occur, and should be differentiated from Perthe's disease. He did not think that even Dr. Innes could determine accurately the pathogenesis of every primary tuberculous lesion, either in life or at *post-mortem*. Because they did not see the calcification of tuberculous lesions in the dog, as in the human being and in the cow, they should not assume that tuberculosis acted in the dog exactly in the same way as it did in the human being; and that if it did not, there must be something wrong with their pathology. He had been brought up to recognise that there was a different physiology in each species, and that in order to understand its pathology it was necessary to learn the physiology of that species. The dog had the dog's way, not man's way, of dealing with tubercle bacilli. For Dr. Innes to bring the human being into this question was trite, but it was not logic. It was certainly not the English school of pathology, and he was not going to let Dr. Innes get away with it. The question of the incidence of tuberculosis was of much greater interest to the clinician. His (Dr. Hare's) old students would remember his saying that they would not understand the incidence of tuberculosis in dogs until they were in possession of the information which only the private clinician could give them. It was an artificial incidence in a place like the Royal Veterinary College; the incidence there was possibly a very rough guide, but nothing more. At one time he was dealing with a kennel of Great Danes in the practice of one of his colleagues, and in the course of six months in that one kennels alone they had 16 cases of tuberculosis. If, after that meeting, his clinical colleagues went back to their practices and kept records of their cases, they would begin to get a true reflection of the incidence of canine tuberculosis in this country. He was under the impression that tuberculosis was a much more common disease amongst dogs than the figures from the Royal Veterinary College led them to believe.

They had heard disparaging remarks about the tuberculin test, which was of vital importance to the clinician, who had not the time or facilities for laboratory procedures. Practitioners, when they were called to a case, wanted to do something that would give them a reliable diagnosis, if possible within 48 hours. He hoped the Royal Veterinary College would extend their investigations into the efficacy of the respective tuberculin tests. He would suggest their trying the von Pirquet test; *i.e.*, the scarification of an area of the skin and the application to that area of a concentrated tuberculin. If the tuberculin was properly made, the von Pirquet test was a very useful guide in (1) febrile cases, and (2) those cases where the application of the subcutaneous test aroused concern in the client's mind. The application of the intradermal test offered greater difficulty. He (the speaker) hoped that some of the younger men would take up these three different tests and would give them the benefit of their experience in the course of the next two or three years. He believed that the tuberculin test was an important addition to the armoury of the

clinician in the diagnosis of what he believed to be a not uncommon disease of the dog.

Dr. Innes now rose to say that the remarks were not meant to be disparaging in any way because he had the greatest respect for Professor Wright as a clinician and his colleagues. Nevertheless, the knowledge concerning the disease had been contributed to a very great extent by morbid anatomists, to which work little attention had been paid that evening. With regard to the remarks of Dr. Hare regarding primary infection in the aorta, meninges, bones, suprarenals, etc., it hardly seemed necessary for him to refute such statements other than again to say that it did not occur and that they were secondary to a primary focus elsewhere. These observations were not his own but well-substantiated facts, the work of renowned authorities, whom Dr. Hare apparently had never consulted, and were generally accepted in the realm of pathology. The entrance of those facts into standard textbooks was proof of this. To mention only a few of those authorities there were Parrot, Kuss, Albrecht, Ghon, Ranke, Aschoff, Huebschmann, Schmorl, Rich, Opie and Pagel, as far as the disease in man was concerned and Nieberle and Pallaske in animal pathology, all of sufficient renown to carry weight behind his (the speaker's) statements. Particularly, he should like to refer Dr. Hare to the work of Rich in America over his statement regarding meningitis. Rich showed that not only was meningitis never a true primary lesion but that it was also never due to secondary generalisation *via* the blood stream in the same way as the kidneys, etc., were affected. Tuberculous meningitis, according to Rich, was always due to breakdown of a focus in the brain substance causing the liberation of showers of bacilli into the adjacent meninges. It was also relevant to note that several workers (and he had proved this to his own satisfaction) had shown that meningitis could not be produced by simple injections of virulent tubercle bacilli into the arterial circulation, even when injected into the carotid.

In respect of Dr. Hare's observations, if he (the speaker) had been dogmatic it had been with a purpose, namely, to show that much had been done and still could be done when the disease was viewed through the eyes of the morbid anatomist.

Professor G. H. Wooldridge commented that the very wide survey of the condition of tuberculosis in the dog that had been given to them by the four speakers who had opened the discussion left little to be said, but there were one or two things that he might emphasise. A feature that would impress particularly those practitioners whose work amongst bovines had been greatly augmented by canine work in recent years, was the great difference between tuberculosis in the dog as compared with the larger animals in respect of character of the affection of the serous membranes, and effusion into the body cavities. He had been particularly surprised of late with regard to the frequency with which the chest was involved as compared with the abdomen, but that seemed to occur in intermittent sequences. At one period they met with an enormous preponderance of abdominal tuberculosis in the dog as compared with pulmonary; then the proportion was reversed—now, and over quite a long period of time, the two conditions in his experience had occurred with approximately equal frequency.

He considered that in many cases of thoracic tuberculosis infection had been by way of the alimentary tract. Dr. Innes would think him a heretic in saying that, but he believed that the heresy of one day often became the accepted fact of the next. He did not agree that apparently primary pulmonary lesions must of necessity be due to inhalation. In his opinion, the bacilli might pass into the blood stream by penetrating the tissues and leave no macroscopic lesion at the point of entry. If so, one might find apparently primary lesions far distant from the point of entry of the organisms. In this connection, he might remind them of the experiments carried out in horses to determine the mode of infection in glanders. These horses, which were kept under obsevation for some time prior to the experiment and were shown by the mallein test to be free from glanders infection, were then infected by cultures administered by the mouth in potato bolus hermetically sealed. Later, on *post-mortem* examination marked lesions were found in the lungs having characters of acute primary lesions; they must have been produced by infection through the alimentary tract. He was of opinion that the same thing might occur in tuberculosis, and if one could get infection in that way it was possible that infection of remote organs might occur.

He did not wish to say more at that time of the evening, other than to thank those who had introduced the subject and Dr. Innes for his observations—although he, for one, refused to take Dr. Innes quite as seriously as might have been done by some.

Dr. F. C. Minett observed that he had no special knowledge of tuberculosis of the dog, but while sitting there he had formed the impression that Dr. Innes had a profound knowledge of the subject and he would compliment him on this.

With regard to the question of primary tuberculosis, it was well known that the tubercle bacillus was a "hard nut to crack," and he could not believe that in invading the body it would fail to produce some lesion at or near the point of entry. At the time the examination was made, this lesion might have largely disappeared. Any opinion that might be formed as to the existence or otherwise of this primary lesion would probably depend upon the thoroughness with which the search was made. The analogy with the glanders bacillus, previously mentioned, was perhaps not a good one because the glanders bacillus was a more delicate organism than the tubercle bacillus, and would, therefore, be destroyed in the body more easily.

Mr. C. Formston reported that he had seen several cases of discharging sinus in the neck of the dog and cat in which, on taking a direct smear of the discharge and staining it, tubercle bacilli had been shown on microscopical examination.

A Member, referring to the fact that Professor Wooldridge had mentioned that in the past he had noticed a preponderance of abdominal cases and more recently thoracic cases, enquired if that change might not be due to the fact that, the Royal Veterinary College being in London, the milk consumed by the dogs seen there was now largely pasteurised; consequently, there was a decreasing proportion of cases in which the abdominal organs were affected.

Professor Wooldridge replied that he accepted that as a possible explanation to some extent, but one must realise at the same time how frequently a dog would lick up human sputum, which he thought was much the most common mode of origin of human tuberculosis in the dog.

The Replies

The invitations extended by the President to those openers of the discussion who were present to reply to the points raised were accepted by Miss Oyler and Dr. Orr, Dr. Stableforth intimating that he had no further observations to make.

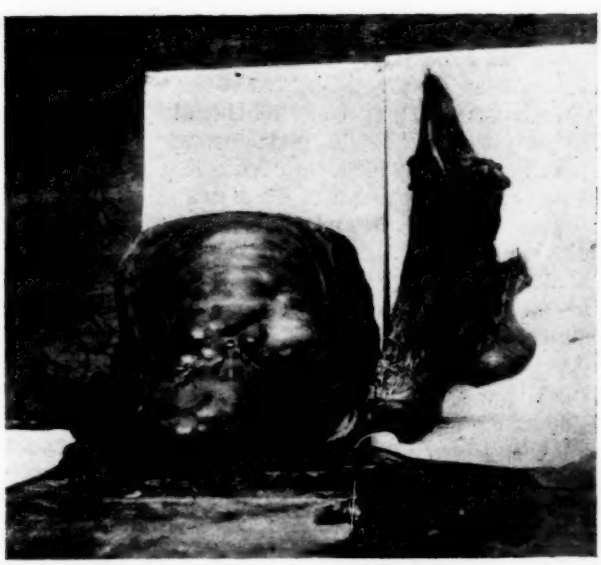
Miss Oyler said that she had very little to say in reply, particularly as very few people had commented on the clinical aspect of tuberculosis in the dog. In future, however, she would certainly pay more attention to the localised lesions mentioned, and especially tuberculosis of the bones.

Dr. Orr said that he would like to mention a point in connection with Dr. Innes' reference to polymorphonuclear leucocytes. He (the speaker) was of course referring to tuberculous pleurisy in the dog and to the fluid that was present in these cases in the chest.

In regard to the question of the incidence of the disease in dogs, the incidence of the disease as arrived at by *post-mortem* records might be very false, as could be readily seen by an analogy with the incidence of distemper. In *post-mortem* work they might only see two cases of distemper in a year, but they would hardly accept that as a sound record of the incidence of distemper in dogs: the same thing might apply to tuberculosis. Concerning tuberculous pleurisy, he had not mentioned that he had, perhaps unreasonably, assumed that it was a primary pleurisy.

AN OVARIAN TUMOUR

A correspondent forwards us the accompanying photograph of an ovarian tumour and uterus taken from a cow, stating that their combined weight was approximately 50 lb.



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ANTHRAX OUTBREAK AMONG HORSES

An outbreak of anthrax has resulted in the death of three horses, each valued at £60, belonging to a farmer at Coupar-Angus, who noticed symptoms of illness in one horse on the morning of June 1st. This animal and two others died during the day, and after one of them was conveyed to the knackery *B. anthracis* was detected in the carcases at the farm.

Report

[Reports on the Work of Agricultural Research Institutes and on certain other Agricultural Investigations in the United Kingdom, 1933-34. Published by H.M. Stationery Office, 1936. Price 5s. nett.]

This is a publication consisting of 350 pages of closely printed matter, which gives brief summarised reports on an immense variety of subjects, each of which is of greater or lesser importance to Agriculture. The volume is sectionalised, and though perhaps at first sight such sections as those on Soils, Plant Nutrition, and Plant Physiology; or Plant Breeding, Crop Varieties and Seeds, may not appear to have a great deal of interest for the veterinarian, yet a perusal of them makes most instructive and interesting reading, and in some instances research work of a purely botanical nature may have quite important repercussions upon animal health and disease. For instance, at Rothamsted more than a commencement has been made in linking up plant nutrition and animal nutrition, while at Aberystwyth progress has been made in developing a pasture type of indigenous Cocksfoot with broad leaves, high palatability and a capacity for early growth in spring, which gives high promise for grazing animals. Similarly, the mass of research work on intensive grassland management being prosecuted has a very direct bearing upon the work of the veterinarian. As is pointed out, there is a definite element of risk attached to unduly heavy concentration of stock upon grassland, when once infestation with parasitic worms commences.

A large and informative section deals with the results of modern research on Breeding, Cultivation, Management, and Diseases of Fruit Crops of all varieties. Study of this section enables one to realise more forcibly than ever what an enormous amount of scientific endeavour is being directed towards making this particular section of British Agriculture more successful—a section about which the ordinary "man in the street" (if such there be) knows practically nothing.

The section on Plant Pathology, as distinct from the specific plant diseases, records work done at four different Institutes.

There is little doubt, however, that our readers will be much more interested in the reports of those Institutes where work upon such sections as Animal Parasitology, Pathology, Nutrition, Breeding, and Dairy Husbandry and Bacteriology, are dealt with, than in more purely agronomic research.

It may be advisable to pick from the report a number of items which, although they may already have been reported in the scientific

journals, are not perhaps generally known to everyone.

The Institute of Agricultural Parasitology reports progress made on investigations on the survivability of fluke eggs and the intermediate host snail during very dry weather, and concludes that great hope of success should attend a concerted effort to destroy free-living stages during dry weather in summer. They even suggest something of the nature of a "Fluke Week" organised on the lines of the annual "Rat Weeks." The same Institute reports the determination of the wild rabbit as a reservoir of infection of sheep trichostrongyles, a fact which hitherto has not been appreciated. The Research Institute in Animal Pathology reports the unsatisfactory nature of indirect methods of diagnosis of chronic bovine streptococcal mastitis when compared to direct cultural methods. A notice is included of failure to obtain satisfactory results from the use of a German acridine compound, injected into the udder after milking, in the treatment of mastitis. The progress of the work on contagious abortion control is also mentioned.

The work at the Institute of Pathology at Cambridge includes studies on virus diseases, where contagious pustular dermatitis of sheep and fowl paralysis are engaging attention. Various routine investigations are reported. The Ministry of Agriculture Veterinary Research programme in the investigation of foot-and-mouth disease has been continued at Pirbright. Examination of small animals killed on infected premises revealed a naturally contracted case of the disease in a hedgehog, and led to the use of these animals for experimental purposes. Observations on the duration of acquired immunity in cattle and pigs are being continued and extended. At Weybridge, it is noted that evidence of *Brucella abortus* infection in pigs' blood was only present in a very small proportion of cases examined. Among parasitological investigations at the Ministry's Veterinary Laboratory, one notes that a new method of estimating the number of trichostrongylids in the stomach and small intestines of sheep is suggested as an alternative to the egg-count method, which latter may give unreliable results owing to the adverse effect on egg-laying which the immunity responses of the host may exert.

Details of the method are not given, but published accounts may be seen in the *Veterinary Record* (1934). Vol. 14, pp. 474-475. There is also mention made of the use of the instrument for removing *Syngamus* worms from the tracheae of affected fowls, which has already been mentioned in the columns of the *Record*. Biochemical activities include work on hypomagnesaemia, in relation to the so-called "lactation tetany," which is also receiving attention at various other Institutes.

From the Animal Diseases Research Association at Moredun there is a report on the successful results of the control of tick-borne fever and louping ill. Much of this work has also been reported and will be familiar to our readers. It is mentioned that results of work carried out seem to show that a single injection with braxy vaccine confers an adequate degree of protection, when compared with double injection. It has also been shown that though the well-known method of pig-dung administration as a prophylactic does afford a measure of protection against braxy, it is much inferior to the injection of vaccine.

One sentence only mentions grass sickness—to the effect that "toxin of *Cl. welchii* (Type D Wilsdon) has been demonstrated in the filtrates of intestinal contents of certain acute cases of grass sickness." A certain amount of parasitological work on *Ixodes ricinus*, *Myiasis* of sheep and *Demodex folliculorum* var. *ovis*, is also reported.

From the Veterinary Research Division of the Ministry of Northern Ireland, a brief note indicates that progress is being made in the use of a new type of dead vaccine in the control of contagious abortion of cattle. This disease is also mentioned as one of the items on the research programme of several other veterinary institutes. There is a reference to the Spahlinger vaccine, indicating that a full report was in preparation. (This has since appeared).

The report of the activities at the Animal Nutrition Research Institute at Cambridge will make interesting reading for those who have not had an opportunity to read the original papers. Investigations of the changes in digestibility, starch and protein equivalents, amount of fibre, etc., in perennial rye grass, wild white clover, and lucerne, of the value of grazing for pigs, and the determination of the food requirements for pigs when on grass, and of the capacity for consumption and food requirements for sheep up to 200 lb. live weight, have been carried out. To appreciate fully this work it is essential to read the original publications—a sentiment which equally applies to most of the other work detailed in this report.

In the section of physiological research, sterility, artificial insemination, reciprocal crosses between Shire horses and Shetland ponies, factors affecting meat and the colour of the butter fat, are mentioned. In connection with butter fat colour, it is interesting to note that colour index scales have been used for milk of the different breeds of cattle and mean values and variability curves drawn up. The records from the Dairy Show and from herds in different parts of the country have been employed.

The section dealing with the Rowett Research Institute at Aberdeen contains references to

work done on nutrition in relation to disease, in which rats deprived of vitamin A were found to develop lesions in the intestinal canal earlier than was previously supposed. Changes in blood composition during pregnancy and lactation have been studied in cattle and sheep. This work is planned to extend over a series of years.

Experiments to compare different methods of ensilage, including the A.I.V. acid preparation and treatment with molasses, have been carried out. The foods used included potatoes and cabbages. Artificially dried British clover meal has been compared with American lucerne meal for feeding to dairy cows. The clover meal was found satisfactory as a source of carotene to maintain a satisfactory milk colour and as a stimulus to total production of milk.

Perhaps the most interesting sections dealing with the work of the Animal Nutrition Division of the Ministry of Northern Ireland are those which refer to an investigation of various methods of controlling anaemia in suckling pigs and the use of rye middlings. The treatment suggested by American workers of smearing the sow's udder with a solution of the sulphates of iron and copper and treacle gave satisfactory results in preventing anaemia. It might be observed that this method has been tested very thoroughly by many workers and by a large number of breeders and found to be a very efficient means of supplying iron to suckling pigs. Middlings produced from the milling of rye used in various human "slimming" dietaries, have during the past few years come on to the market in large amounts. Rye middlings can be used satisfactorily if fed up to 20 per cent. of the total ration to fattening pigs. It is reported that if fed up to 40 per cent. of the ration, however, very severe scouring is caused. Pollards substituted for the rye arrested the diarrhoea.

The Institute of Animal Genetics, Edinburgh, divides its report into Genetics, Avian Sex Physiology, Animal Husbandry, Sex Physiology, Rabbit and Sheep Breeding. The report on Genetics contains references to the inheritance of plumage colour in turkeys, geese, budgerigars and canaries, and to *Drosophila pseudo-obscura* and the educability of the rat. Amongst other matters dealt with in Avian Sex Physiology is an explanation of the reason for blood smears on the first egg laid by a pullet. A thin membrane occludes the posterior opening of the oviduct in the chick. Under hormonic influence a tiny hole appears in its centre which gradually enlarges, long before the first egg is laid. When this occurs the membranous opening may be insufficiently large to permit the egg to pass and it is ruptured in consequence. Some evidence has been collected which shows that the index for egg-shape (length/breadth) is highest in periods of low production, *i.e.*, a long narrow egg, and lowest during high production (a shorter thicker egg). An examination is being made to determine whether the index of shape may be used as a basis for selection. Other work involving the inheritance of milking capacity in cows, the inheritance of fur characters in rabbits and wool quality in sheep, and of various deformities such as microphthalmia, hare-lip, cleft-palate, hernia, etc., in rats and sheep, is discussed.

Sections dealing with Dairy Research, Agricultural Economics, Food Investigations, Fruit Preservation, Engineering, and with the results of Local Investigations at Advisory Centres, are also included.

Those who are closely in touch with modern Agricultural Research will probably be disappointed with this Report on the grounds that before it appeared the results of many of the investigations were already available in the scientific literature. It would almost seem that some criticism could reasonably be levelled at a Government Department which published in the middle of 1936 a report of work for 1933-34: it is out-of-date before it is published.

To those who have not opportunity to see current scientific agricultural literature, however, it can be fully recommended, not only for its intrinsic value, but because it serves as a sort of "Who's Who" in Agricultural Research, and it contains lists of the papers published from each Institute for the years under review. Further, it serves as a more permanent record of activity, available for reference in future years.

W. C. M.

TINNUTRITION

Strong criticism was made at a meeting of the Retford Rural Council, when the annual report of the Medical Officer of Health was discussed, of the too frequent recourse to tinned food and the tin-opener in country districts.

The Medical Officer of Health stated that there was no widespread malnutrition in the area, but he had frequently drawn attention to the fact that where malnutrition existed it was not so much due to an inadequate quantity of food as to the fact that the family income was not economically expended.

It was common knowledge, he went on, that in many villages a large proportion of working-class families seldom had properly cooked fresh food, but depended for their nourishment on tinned foods, bread and tea, and the women of the house appeared to have lost the art of simple cooking and relied more on the use of a tin-opener and ready-prepared foods than was desirable. If these families could be brought to realise that these methods were not only expensive, but definitely harmful, much would be done for the improvement of physique and health of their children.

ROYAL COLLEGE OF VETERINARY SURGEONS

Annual Meeting at Edinburgh

The Annual Meeting of the Royal College of Veterinary Surgeons was held at the Royal (Dick) Veterinary College, Edinburgh, on Thursday, June 4th, 1936, when the following members were present: Mr. J. W. McIntosh (President) in the chair, Messrs. S. G. Abbott, W. Anderson, Captain J. R. Barker, Professor G. F. Boddie, Dr. O. Charnock Bradley, Mr. David Brown, Professor J. F. Craig, Mr. C. B. Davidson, Captain H. Gillmor, Mr. A. Gofton, Captain O. V. Gunning, Messrs. W. H. Horne, H. V. Hughes, W. A. Ireland, Captain J. Ker, Professor R. G. Linton, Mr. James McDougall, Captain J. B. Mackie, Captain W. M. Mitchell, Mr. W. Nairn, Captain J. F. Player, Major D. S. Rabagliati, Mr. James Reid, Captain J. R. Rider, Messrs. J. N. Ritchie, E. J. H. Sewell, Lieut.-Colonel P. J. Simpson, Captain R. Simpson, Major A. Spreull, Mr. H. W. Steele-Bodger, Captain James F. Taylor, Mr. A. Thomson, Captains P. W. Walker, Wm. Watt, Dr. A. W. Whitehouse, Messrs. W. Woods, J. E. Wilson, Dr. W. R. Wooldridge, and Mr. W. Jackson Young.

The Secretary read the notice of the meeting as it appeared in the *London Gazette* of May 8th, 1936.

Letters of apology for absence were received from Colonel J. W. Brittlebank, Professor J. B. Buxton, Mr. J. C. Coleman, Mr. H. W. Dawes, Mr. P. F. Dolan, Major G. W. Dunkin, Sir Frederick Hobday, Mr. J. Holroyd, Major Hamilton Kirk, Mr. G. H. Livesey, Mr. J. Macfarlane, Professor J. J. O'Connor, Dr. J. Share-Jones, Major F. J. Taylor, Captain W. K. Townson, Colonel G. K. Walker and Mr. H. E. Bywater.

The minutes of the previous Annual Meeting, having been published, were taken as read and signed as correct.

ELECTION OF COUNCIL

The Secretary read the auditors' report on the counting of the votes as follows:—

"We certify that we have checked the voting papers sent in for the annual election of eight members of the Council of the Royal College of Veterinary Surgeons, and the number of votes obtained by the eleven members nominated for the vacancies are set out below against their respective names:—

Name.	Votes.
Locke, G. H.	823
Wooldridge, G. H.	818
M'Fadyean, J.	800
Buxton, J. B.	775
Mitchell, T. M.	670
Share-Jones, J.	652
Willett, J.	636
Tutt, J. F. D.	520
Webster, G. C.	465
Watson, A. H.	464
Hare, T.	388

There were eight spoilt papers and eighteen were received too late."

(Signed) Woodhouse & Wilkinson,
Chartered Accountants.

Declaration of Election

The President thereupon declared the following to be duly elected members of the Council: Locke, G. H.; Wooldridge, G. H.; M'Fadyean, J.; Buxton, J. B.; Mitchell, T. M.; Share-Jones, J.; Willett, J.; and Tutt, J. F. D.

Irish Free State Representative.—The Secretary read a letter from the Returning Officer for the Irish Free State election announcing that Professor J. J. O'Connor had been duly elected representative of the Irish Free State on the Council of the College.

ANNUAL REPORT AND FINANCIAL STATEMENT

The President, in submitting the Annual Report of the Council to the meeting, said: I should like to draw your attention to some of the more important matters dealt with in the Report. The Council had the great pleasure last year of sending a message of congratulation to His Majesty King George on the Silver Jubilee of his accession, and a gracious message of thanks was received in reply from His Majesty. To the profound sorrow of all His Majesty's loyal subjects, his reign was brought to a sudden and unexpected close in January of this year. This event cast gloom over the whole country, and the Council at a special meeting held on January 22nd sent a message of condolence to Her Majesty Queen Mary and to our new King, Edward VIII. It is with the utmost pleasure that I am able to tell you that King Edward, who in 1923 was elected an Honorary Associate of the College, has now graciously expressed his desire to be Patron of the College. (Applause.) This mark of Royal favour will give the keenest satisfaction to members of this profession in every part of the British Commonwealth of Nations. (Hear, hear.)

Passing to the business of the year, I will merely remark that a number of alterations to bye-laws have been found necessary, all of which are specified in the Report. The figures relating to the number of students examined show that in 1935 a total of 362 students presented themselves for the four examinations of the Four Years' Course, and 558 for the three examinations which were held under the Five Years' Course, a grand total of 920, the largest number ever examined in one year during the existence of the College.

The Examination Committee has in consequence been the hardest worked of the Standing Committees, but under the able guidance of its Chairman, Professor Buxton, it has managed just to keep its head above the avalanche of papers, reports, questionnaires, memoranda, and so on which have fallen on it during the year.

The work of the Registration Committee has also been very heavy. This Committee deals with complaints against members for unprofessional conduct, and with charges against unqualified persons who assume a professional title prohibited by the Veterinary Surgeons Act. The constant vigilance of the Committee in the latter respect is a safeguard to the public, in whose protection the Act was passed. Amongst the complaints against members was that of canvassing, and I regret to say that the delinquent was a Scotsman. He was found guilty, and it was my very unpleasant duty to pass upon him a severe censure. It is to be hoped that the experience through which he passed will have taught him that it is the Council's rigid intention to maintain a high standard of conduct among its members.

The Parliamentary Committee have been successful in securing amendments to certain Municipal General Powers Bills, safeguarding the rights of the profession in the matter of the inspection of infected stables. This Committee has done other excellent work during the year, as the Report shows.

The Library Committee's Report shows that over 1,000 loans were made from the College Library during the year. That gives some idea of the help which the Central Library for Animal Diseases can render. The work has grown to such an extent that the Council has now authorised the appointment of a whole-time qualified librarian. A catalogue of the books published since 1900 has been prepared and will soon be on sale, and the Council hopes that it may lead members to make still further use of the services which the Library can render.

The Report concludes with the Financial Statement, and this I am happy to state shows that the College is in a satisfactory condition for the time being. The Council has been able to invest £2,580, and will continue to conserve the College resources in the endeavour to build up a reserve fund for a rainy day.

On the motion of Mr. Gofton, seconded by Professor Craig, the report was adopted.

PRESENTATION OF FELLOWSHIP DIPLOMAS

The President: We have now come to a very pleasing part of the proceedings. As you are doubtless aware, by the Royal Charter of 1932 your Council is empowered to admit in any one year two members of not less than twenty years' standing to be Fellows of the College, on account of their special eminence in veterinary science. This power is one which must be sparingly used, and up till now only two members have been admitted to this honour, namely, Sir John M'Fadyean and Dr. Charnock Bradley, eminent and worthy recipients, both of whom were Edinburgh graduates.

This year your Council has added to that list two other distinguished names—Professor James Ferguson Craig, of the William Prescott Chair in the University of Liverpool, and Professor James Douglas Stewart, Dean of the Faculty of Veterinary Science in the University of Sydney. (Loud applause.)

Professor Craig is well known to all of you. He began his veterinary training in Glasgow under the late Principal M'Call, with a flying start, for he was already a Master of Arts, and after completing his first and second examinations at the Glasgow College he proceeded to London, where he completed his third and final examination, and was the winner of the Walley Prize of that year. He was at once appointed "tutor," which office he held for a year before going to the Dublin College as Professor of Anatomy in 1903. When Professor Wooldridge left Dublin in 1908 for London, Professor Craig succeeded him as Professor of Medicine and Parasitology, and on the death of Principal Mettam, in 1919, Professor Craig was appointed Principal, a position he occupied with distinction until last year, when he was appointed to the William Prescott Chair in the University of Liverpool.

During the 34 years he has been a member of the College he has made many notable contributions to Veterinary Science. His researches have ranged over anatomy, parasitology, toxicology, medicine, surgery, and epizootiology; he edited the third and fourth editions of Fleming's "Obstetrics," and contributed important sections of Wallis Hoare's "Veterinary Medicine" and Wooldridge's "Encyclopaedia of Veterinary Medicine." He also acted as examiner for the Universities of London, Liverpool and Belfast. In 1931 the Council of the Royal College awarded him the high honour of the Steel Memorial Medal, in recognition of the merit of his scientific and literary work. His services to the profession as member of the Veterinary Medical Association of Ireland, and on the Councils of the R.C.V.S. and the National V.M.A., are too well known to require more than mention; he is a past-President of all three bodies.

I am sure this brief recapitulation of some of the outstanding qualities of Professor Craig is more than sufficient to prove that he is worthy of this last honour which the Council has conferred upon him. (Applause.)

On Professor Craig going forward to receive the honour, the President, addressing him, said:

It is a very great pleasure to me to have the privilege of handing you this Diploma of Fellowship as a recognition by the Royal College of the sterling quality of the work you have done for the profession and of your eminent services to Veterinary Science. I warmly congratulate you, and I hope you may be long spared to continue your useful work.

Professor Craig: I should like to say, in a word, how much I appreciate the high honour which the Council in their wisdom have thought fit to bestow upon me. And I thank you, sir, for the very kindly way in which you have made the presentation.

The President: Professor James Douglas Stewart is not able to be with us. It is being arranged that the Fellowship will be conferred upon him at the annual meeting in Australia to be held in August, when a representative of the profession, in the name of the Council and the President, will hand over the Diploma to him. Professor Stewart is a graduate of this College. His name is not so well known to the profession in this country, but he has done a great deal of excellent work in Australia and in the University of Sydney. Your Council considered that by conferring this honour on him it would be showing our sympathy and interest in this young veterinary school and encouraging an earnest worker to continue his notable services. (Applause.)

Vote of Thanks.—Dr. Charnock Bradley: We cannot permit this meeting to close without expressing our gratitude to the President for the dignified way in which he has carried out the duties of the Chair. Our gratitude, of course, extends further back than this meeting, but for the moment I think we may thank him for to-day's performance. (Applause.)

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The Annual Luncheon

The Annual Luncheon of the College was held at th North British Hotel, Edinburgh, at 1.15 p.m. immediately after the Annual Meeting. The President occupied the chair, and the following guests were present: Professor D'Arcy Wentworth Thompson, C.B., D.LITT., President of the Royal Society, Edinburgh; President, Royal College of Physicians; President, Royal College of Surgeons; President, National Veterinary Medical Association, Sir T. Hudson Beare, Professor Bramwell, Mr. P. R. Laird, Mr. Alexander Murdoch, Colonel McLeod Robertson, Dr. Scott Robertson, Bailie Given, Dr. J. D. Gilruth, Dr. J. E. Mackenzie and Mr. G. C. Mercer.

There were also present about 80 members of the profession.

"The Royal College of Veterinary Surgeons"

After the Royal toasts the President called upon Profesor D'Arcy Thompson to propose the toast of the Royal College of Veterinary Surgeons.

Professor D'Arcy Wentworth Thompson, C.B., D.LITT., in speaking to the toast, said he had certain family links, of which he was very proud, with the veterinary profession. He wondered whether there was a single man in the room old enough to remember the rinderpest outbreak in the 1860's: for his part, he could remember as a lad of six or seven years being taken by his old grandfather to one or two of the dairies in Tollcross which were the first centres of that great plague in the district, and where as in the other dairies of Edinburgh, dairy cows were being swept down till something like five-sixths or more of the dairy cattle in the district died. That was about the year 1866, and that in itself implied that he had very early recollections of the veterinary profession. He had just been reminding Dr. Bramwell that his distinguished father-in-law, B. J. Cunningham, afterwards Professor of Anatomy in Edinburgh University, at one time lectured in the old Dick College in Clyde Street, and asked him after he had been studying anatomy for a couple of years to go down and be his demonstrator there. He accepted the post, but it so happened that he changed his mind and went off to Cambridge, and never officiated in the old College as he was invited to do. It would have been a pleasant reminiscence indeed if he had been able to tell them he had been there.

To leave these things for a moment and come to the toast he was proposing, the toast of the Royal College of Veterinary Surgeons: that really meant that he was proposing the toast and singing the praises of the great profession to which they belonged. He was old enough to remember that, fifty to seventy years ago, their profession was not so esteemed, and did not stand so high as it did to-day in the general estimation of the world. But veterinary science had grown with the times and had become an essential part of science in the widest sense. In this country they had built on the work of men like Lister and Bruce and others, and had found their science growing until it took rank firmly with the sister science of human medicine. It had grown beyond all the dreams of those who established veterinary education in this country a long hundred years ago. When the old Veterinary College under Coleman was established, what was the science? Shoeing of horses, lameness, glanders occasionally—a limited field. Now their science took them over a vast and ever-growing field.

Professor Thompson recalled that an uncle of his, John Gamgee, practised in Edinburgh 70 years ago, and came to be an assistant to William Dick in Clyde Street. He came from an upbringing in Italy by an English father—also a member of their profession—speaking at least three languages fluently besides his own. He came with a knowledge, most remarkable in his time, of general pathology, anatomy, and medicine, and he was a man bubbling over with enthusiasm, energy, and inventiveness. Gamgee parted company with Dick to establish a veterinary college of his own on the site where Princes Street Station now stood. He started it almost alone. He had no money. That did not matter to him for a time, but the lack of money mattered in the end, and although he was helped by men of greatest ability he could not carry on. He published his journal, the *Veterinary Review*—volumes which were extraordinarily full of interest even when read to-day. He published his little book on "Domestic Animals in Health and Disease"—a charming book to read. When rinderpest came in he was in the thick of it. He had prophesied ten years before what was likely to happen with the then growing traffic in cattle on the Continent, and he marked its steps as it came nearer; when, at last, it came he urged upon the Government the necessity of slaughtering the diseased cattle, of isolating the infected farms, and of taking all the other precautions that nowadays seemed so natural, costly and drastic though they might be. The Government would have been inclined to accede to his views, but the House of Lords was dead against them, and people cried out, "How are you going to save our cattle by slaughtering them?" and "Are you going to run into expense by compensating dairy farmers?" To make a long story short, those prophylactic measures were refused, and rinderpest for the time being swept the country bare.

Gamgee transported his little college to London, where failure stood at his side again. Not only was he a veterinarian before his time, he was amazingly inventive. He was the first man to think of the idea of preserving meat by freezing and of bringing frozen meat from the other side of the world. He made nothing of it. The idea of artificial freezing and the manufacture of ice led him to think of an ice skating rink, and he actually set up a little rink in Edinburgh. It worked perfectly, but nobody backed it. One of his patents was the original patent for the penny-in-the-slot machine, and he actually suggested using the penny-in-the-slot contrivance for the distribution of postage stamps as it was now used.

These were only a few of the things that John Gamgee put forward in an age when he was far before his time. Professor Thompson said he mentioned these things because his uncle was a member of their profession, and he assured them that his uncle did what he could to raise the profession and to make it felt in the world; he used every ounce of his strength in its advancement and honour. It was he who called the first International Conference in Hamburg in the year 1863, and he took an active part in it.

In conclusion, Professor Thompson observed that he himself had the highest possible appreciation of the advancement of their science, knowing how they and science had pulled together, how science had been indebted to them, and how immensely they were indebted to it. **(Cheers.)**

The President, Mr. J. W. McIntosh, M.R.C.V.S., F.R.S.E., in his reply, said they had earlier in the day been dealing with matters of a more or less domestic nature, and their national organisation at its meetings that day and on the previous day had endeavoured to smooth out those wider and knotty problems which confronted the profession from time to time. The Royal College of Veterinary Surgeons were a corporate body to which was entrusted the government of the profession—they were an educational, licensing, and disciplinary body. It had occurred to him that it would not be inappropriate if he told them something about the founding of veterinary education in this country, and particularly the founding of the first veterinary school in that great city of Edinburgh. The first veterinary school was founded in London in the year 1791, and like most new institutions its earliest efforts were greatly handicapped by lack of funds; indeed, but for the help given it by medical teachers who admitted students free to their lectures it might have disappeared. To that immortal anatomist and physiologist, John Hunter, and to his attached and illustrious pupil, Edward Jenner, the profession owed much.

With that indomitable perseverance and determination which was characteristic of British character and enterprise a further school was established in that city in 1823 by William Dick, a man of great genius and personality. William Dick was the son of an Edinburgh farrier, and followed for a time his father's trade, but a series of lectures on medicine by John Barclay which he attended, stimulated the ambition he already cherished to qualify as a veterinary surgeon and establish a school in Scotland. In 1817 he decided to go to the London Veterinary College. After an attendance of three months, however, feeling that there was little that Coleman could teach him, he asked for and received his diploma on January 27th, 1818. Dick then returned to Edinburgh, and after two unsuccessful attempts to form a class he succeeded in 1820-21 in obtaining nine pupils, and in 1821-22 he had a class of seventeen. He had now established

himself as a teacher, and in the following year the Highland Society (now the Highland and Agricultural Society) came to his aid, and under the protection of this powerful body the school grew and flourished.

In 1833 Dick was able, out of his own finances, to build himself a school in Clyde Street—a place and college well known and affectionately remembered by many present that day. Before the Highland Society came to his assistance in 1823 an attempt had been made to get the school placed under the University. That attempt, however, failed, but Dick received from Dr. John Barclay and Professor Goodsir such encouragement in his work as he never forgot, and 60 years later the Barclay-Goodsir Lectureship in Comparative Anatomy was endowed in the University out of the estate of Dick's sister, Mary; and they had with them that day Dr. O. Charnock Bradley, who was the first and only one who had occupied that chair. (Cheers.) Everything went well with Dick's School. By 1839 he had over 100 pupils. After some years the existence of two bodies granting diplomas was considered to have disadvantages, with the result that the profession obtained a Charter of Incorporation in 1844, for which Dick was one of the seven petitioners. For some considerable time afterwards the Edinburgh School retained its alliance with the Highland and Agricultural Society, and that body continued to grant certificates until 1879, when, by agreement, the award of such certificates ceased, and the diploma M.R.C.V.S. became the sole qualification of a veterinary surgeon in this country.

That was a brief outline of what private enterprise had done for veterinary education and science in this country, and they must be for ever grateful to those early pioneers who, at great personal sacrifice, temporary discouragements, and even financial loss, did so much to establish on a sound basis that great inheritance which they now enjoyed.

While the Charter of Incorporation made provision for the election of a Council and officers for the government of the profession, the profession as such dated from 1881 only, for, though the Royal College of Veterinary Surgeons came into existence in 1844, it was not until the passing of the Veterinary Surgeons Act in 1881 that a real legal position was given to the practitioners of veterinary science and imposed upon the Royal College of Veterinary Surgeons certain specific functions and duties. His position as President for the time being really meant that he was Chairman of the Council which was entrusted with the carrying out of these functions and duties—an honour which he very deeply and sincerely appreciated.

Speaking from a somewhat long experience as a member of Council and with a deep sense of its responsibilities, he could assure them it had always been the aim of their representatives to raise and maintain at a high standard the education and training of veterinary surgeons, and to insist that all entrants to the profession should be equipped in a manner consonant with modern standards and modern requirements. He thought they could claim to have fulfilled those duties. The syllabus of instruction and examination was so framed that the young graduate had the necessary groundwork of knowledge upon which he might build, according to his predilection, either a career as a general practitioner, a salaried official, a research worker, or a teacher.

The duty of the Royal College Council was plainly that of giving a general training in veterinary science, leaving it to the individual to specialise, if he so desired, after he had qualified. In no profession was individuality of more importance, not merely as a means of advancement, but in everyday work and everyday life. When they remembered their early struggles and the unfortunate apathy of the public to the claims of veterinary science, they had no reason to be ashamed of the progress they had made. Indeed, he thought it would be impossible to instance any other profession that had made greater progress within the last fifty years. In spite of some temporary discouragements and even surprising opposition, their scope of usefulness was being constantly enlarged, and their ability to serve the interests of the nation was strengthened with each year that passed, and they were determined that that progress should be maintained.

In conclusion, he would like to say that while it was very gratifying and encouraging to hear from such a reliable source as Professor D'Arcy Thompson that the services of the profession were appreciated and that the members of the profession occupied a place in the esteem and affection of the community, they were sometimes inclined to think that in some quarters their value was not as fully recognised as it ought to be. But they were hopeful that wiser counsels would prevail, and that before long they would find, in the words of Rudyard Kipling:

> Each in his place, by right not grace,
> To rule his heritage.

The profession were ready and willing to co-operate in the eradication of disease, but they must have encouragement, and they must have their place in the councils of the nation when schemes for the suppression of disease and the protection of the animal health of the country were being formulated. (Cheers.)

"The Guests"

Dr. O. Charnock Bradley, Principal of the Royal (Dick) Veterinary College, proposed the toast of "The Guests," and mentioned that they

included at least five acting presidents and innumerable vice-presidents of sister sciences. "We appreciate," he said, "the honour that they are doing us, and we hope they will realise to the full that we are glad of their recognition, and that we take it as an indication of the continual interest in veterinary science that has been evinced from the time of William Dick and even earlier."

The toast was acknowledged by Mr. P. R. Laird, Secretary of the Department of Agriculture for Scotland, and Dr. G. Robertson Scott, Permanent Secretary of the Ministry of Agriculture, Northern Ireland.

Mr. Laird said that although too often the function of officers of his Department had been to explain to the colleges why they could not have what they wanted, he thought they had been on friendly terms with the colleges and with the profession. (Hear, hear.) It would be a great tragedy if that were not so, because the veterinary profession, the colleges, the Department of Agriculture, and the Animal Diseases Research Association were the chief partners in the big business whose task was the prevention and cure of animal disease. How important that task was was very evident when one reflected that 80 per cent. of the value of Scottish agriculture was in live stock and live stock products. While amazing advances in research work had been made since the war, with consequent enormous saving to the country, there were still many diseases which were causing incalculable losses to the agricultural industry. That was not due to any lack of skill or labour on the part of those who were working on the research or clinical side. It was partly due to the fact that the field of research had been so recently opened up, and partly due to the unfortunate circumstance that the incidence of disease seemed to have been increasing. It almost looked as if the increase of disease were part of the price they had to pay for more intensive production. In these times when enconomic conditions pressed so heavily on every branch of the agricultural industry they simply could not afford to face any losses that were preventable. Every effort must be made to prevent losses from other causes. One might hope for the time when the veterinary practitioner was able to assist more than he perhaps could to-day in the research side of the great field of research and experiment. In the meantime there was, he thought, enough work to do in the practical field.

There were approximately 3,400 veterinary surgeons on the register, 700 of whom were practising outwith the British Isles. That number was just about the same as before the war. But the increase in the number of students in Scotland alone from 225 to 570 in the last ten years proved that the profession was growing more and more attractive. They found that local authorities were increasingly appointing full-time veterinary officers: twenty-five such appointments had been made in that period of ten years, and as the needs grew one must expect that that number would be substantially increased. Yet with all that, and remembering the peculiar capacity of the world for throwing up another disease as soon as one was conquered, one could not help wondering whether a certain amount of action might not be necessary in the interests of the profession itself, lest the supply of veterinary surgeons should outlast the demand. The status of the profession had been greatly enhanced in recent years, as evidenced by the extension of the diploma course to one of five years and as witnessed also by that very striking increase in the number of students, and he thought it would be a pity if that position of growing importance were in any way jeopardised through too great a supply on a glutted market. He hoped, however, that would not occur.

Mr. Laird concluded with a tribute to the work of Dr. Charnock Bradley, who, he said, was just about to celebrate the completion of 25 years as Principal of the Royal (Dick) College, and who, during those years, had not only maintained but had greatly enhanced the name of the Dick College, and had earned in a very high degree the gratitude of the veterinary profession throughout the country. (Cheers.)

Dr. Scott Robertson said that Northern Ireland was under a big debt of gratitude to the Royal College, because most of their veterinary students came to Great Britain for their training, and because they drew from Great Britain, and perhaps particularly from Scotland, a very large number of the best of their young veterinary surgeons. In the Ministry of Agriculture in Northern Ireland they had no fewer than 64 permanent veterinary officers. During the past few years it had been his lot to interview 100 veterinary surgeons with a view to official appointment. He had been impressed by the number of young men who were entering the profession after a town upbringing, and who had really no knowledge of agricultural conditions. It seemed to him of vital importance that in their scheme of training great stress should be laid on the desirability of veterinary surgeons having as broad a knowledge as possible of agricultural conditions and problems. Whether the training should come before a young man entered college, or during the course of his college career, was a problem that he would leave to others who were more able to decide. Dr. Robertson also pleaded for the adoption of a wider outlook on the question of disease, which he thought should include also the subjects of health and resistance. He could not but

(*Concluded at foot of col.* 1, *p.* 800.)

N.V.M.A. Divisional Report

CENTRAL VETERINARY SOCIETY

While there may be a division of opinion amongst veterinarians concerning the incidence of tuberculosis in the dog, the excellent attendance at a meeting of the above Society at which this disease, as manifested in the canine species, was discussed yielded abundant proof that the subject was at least one of great interest to members of the profession. Discussion of the matter was opened by four members, namely, Mr. A. R. Smythe and Miss M. Oyler (from the clinical aspect; Mr. A. B. Orr (from the pathological aspect), and Dr. A. W. Stableforth (from the bacteriological aspect)—and was well sustained by the general body of Fellows.

The President (Mr. J. F. Macdonald) occupied the chair at this meeting, which was held on May 7th at the Conway Hall, Red Lion Square, W.C.1., and there were also present: Messrs. L. F. Balls, W. F. Barton, V. Boyle, W. Brown, H. E. Bywater, A. Cornish-Bowden, Major W. Denington, Miss C. M. Ford, Messrs. C. Formston, J. Fox, Lieut.-Colonel H. Greenfield, Dr. T. Hare, Miss K. M. Hernaman-Johnson, Miss R. E. Holman, Messrs. J. W. H. Holmes, H. D. Jones, Miss M. G. Jordan, Messrs. H. C. P. King, Herbert King, N. S. King, Lieut.-Colonel G. P. Knott, Miss M. V. Levie, Mr. M. O. J. McCarthy, Dr. J. McCunn, Mr. A. B. Orr, Miss Oyler, Major G. E. Oxspring, Messrs. G. Peace, W. Perryman, Lieut.-Colonel G. Rees-Mogg, Mr. C. Roberts, Miss K. W. Shedlock, Dr. A. W. Stableforth, Messrs. F. H. Stainton, J. S. Steward, Major W. K. Townson, Miss O. Uvarov, Professor G. H. Wooldridge, Dr. W. R. Wooldridge and Professor J. G. Wright.

The following attended as visitors: Mr. H. W. Steele Bodger, Miss R. Datnow, Miss M. Delaneige, Mr. J. L. Greatorex, Miss A. W. Greener, Mr. F. T. Harvey, Mr. W. O. Heitz, Miss K. Morant, Mr. C. W. Ottaway, Mr. J. L. Paterson, Miss L. H. Phillips, Mr. P. M. Sutton, Miss M. Twyman and Miss Dora Williams.

The minutes of the March meeting of the Society, having been published in the *Veterinary Record* were taken as read and were confirmed on the proposition of Mr. H. C. P. King, seconded by Colonel Greenfield.

Correspondence.—(1) From Lieut.-Colonel W. S. Mulvey and Captain R. J. Stow apologising for their inability to attend the meeting.

(2) From the Secretary of the N.V.M.A., dated April 21st, with regard to the free treatment of animals of the poor, and presenting this item, the Hon. Secretary said that this communication had arisen as a result of the representations made by the Society to the "National" in regard to this matter.

The letter was in the following terms:—

"It has been represented to the N.V.M.A., that the schemes for the treatment of sick animals of the poor have such an important bearing on the welfare of the profession that the whole position should now be reviewed.

"The Organising Committee therefore desires to invite your help in the provision of information considered necessary for this purpose, and a list of questions has been drawn up to which the Committee would be obliged if answers could be provided by an early date.

"Several copies of this list are enclosed, so that separate replies can be made by the members concerned in each free treatment scheme in operation in the area of your Division. You will note that space has been left for any further information the practitioners co-operating in these schemes consider should be taken into account by the Organising Committee.

"Perhaps I should mention that the feeling of the Committee was that this information could be supplied by Secretaries of Divisions without the necessity of special meetings being called to consider the question.

"It is hoped that the Committee may rely on you for this assistance."

Several members concerned with the running of free clinics took copies of the questionnaire for filling up and returning to the "National."

Nominations.—The following were nominated for Fellowship of the Society: Miss K. Morant, 24, Watling Street, Radlett, Herts. (proposer, Mr. Holmes; seconder, Miss Oyler); Mr. H. E. Smithers, 194, Whitchurch Lane, Edgware (proposer, the Hon. Secretary; seconder, Mr. T. J. Maguire), and Major Graham Williamson, Station Veterinary Hospital, Aldershot (proposer, Major-General Sir John Moore; seconder, Major Oxspring).

Election of Representatives to the Council of the N.V.M.A.—The Hon. Secretary said that this year the Society were entitled to seven representatives instead of the eight which had represented them last year. That was because the Council of the N.V.M.A. had decided that the membership of the Division should be calculated only upon the number of those members who were also members of the N.V.M.A.

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feel that the veterinary profession and the agricultural industry and all those who were engaged in the fight against disease would gain inestimably by a closer working arrangement, because they were all in a position to contribute their quota to this vastly important subject. Veterinary surgeons had got to learn a great deal about many subjects and many sciences, and they could not of necessity go very deeply into any or many of them, and that was why he felt very strongly indeed that it was desirable on this question of disease to have the broadest possible outlook and the closest possible co-operation among the interests concerned. (Hear, hear.)

The following were elected to represent the Society: Captain L. S. Balls, Sir Frederick Hobday, Major Hamilton Kirk, Captain Dunlop Martin, Professor McCunn, Captain W. K. Townson, Mr. R. A. Willett. These gentlemen were re-elected *en bloc* on the proposition of Mr. H. C. P. King, seconded by Mr. Herbert King, Professor Wright's name being withdrawn at his request as he felt that he had not the requisite time to devote to this service.

Obituary.—The President said that before they passed to the next business, it was his sad duty to refer to the death of one of their old members, Major Tennant of Windsor. Unfortunately, the officers of the Society did not know of his death in time to allow of anyone being present to represent the Society at the funeral; neverthless some of their members were there and he had written to Major Tennant's family expressing sympathy on behalf of the members of the Society. A wreath was also sent. A reply expressing the grateful thanks of the family for that letter of sympathy had been received.

Morbid Specimens and Cases of Interest.—Mr. J. S. Steward exhibited specimens of *Culicoides* saying that they were probably *Culicoides nubeculosus*, for they had not been examined microscopically. The speckled wings and thorax were characteristic of that species. Some of them were alive and some were dead. They were the vectors of *Onchocerca cervicalis*.

Lieut.-Colonel H. Greenfield said that although he feared that he had not with him the specimens relating to the case he had to describe, he thought a recital of the facts would be of interest to the members. He was called in about eight weeks previous to that meeting to see a big farm cart horse which had been bred by the owner's father during the War. It was 20 years old and had never had a day's illness—only half a day's colic—in its life. During the winter it was kept on a very rough farm, but when the weather started to dry up the farmer, to get the animal into some sort of condition, set it to pulling a roller. At the end of the day he found the horse, which he had never known to be lame before, to be very lame indeed. He took it to the local farrier, who could find nothing, and after ten days he (Colonel Greenfield) was called in. The horse could work quite well on wet sodden ground, but on hard ground it was very "hobbly"; in fact, it could put no weight on the affected limb on such ground. He had the horse out and found that it definitely went worse after exercise. Two days afterwards it was very much worse; there was much heat and a certain amount of pain, which led him to suspect the existence of split pastern. Despite the application of antiphlogistine, within a fortnight the horse was showing acute pain. Accordingly, he got one of his Army colleagues to come in as a second opinion—the latter did not agree with him that there was any fracture in the pastern, but he did not know what the condition was. The animal was put into slings, but it continued in great pain and was eventually destroyed. Considerably to his surprise, the case turned out to be one of acute navicular disease in the hind leg, with a bursitis spreading right up the tendon. He took the affected structures to Major Oxspring, who had done so much excellent work on navicular disease, and he was quite confident that this was definitely a case of that condition.

There being no discussion on the cases presented, the President said perhaps he should mention the place and date of the next meeting—it had been decided by the Council that the next meeting of the Society should be held at the Wellcome Research Museum on Thursday, June 4th; the time for holding this meeting had not yet been definitely fixed, but in all probability it would be as usual at 6.30 p.m.

Discussion

The Fellows now entered upon the discussion of the subject of tuberculosis in the dog, which was introduced as already indicated.

In the absence of Mr. Smythe, however, his contribution was read by the Hon. Secretary. Mr. Smythe had sent a number of photographs illustrating the condition of tuberculosis in the dog, also the skeleton of a dog showing tuberculosis of the bones. In addition Mr. Smythe had forwarded photographs showing sarcoma in the dog which might possibly be confused with tuberculosis.

At the conclusion of the discussion, a hearty vote of thanks to the various openers was accorded with acclamation on the call of the President, seconded by Mr. Perryman. Payment of a similar tribute to the President for his conduct of the proceedings terminated the meeting.

H. E. Bywater, *Hon. Secretary.*

WEST SUFFOLK AND CLEAN MILK COSTS

In connection with the cost of milk sampling and veterinary inspection, the West Suffolk County Council have decided that, where the sampling is carried out by the Agricultural Committee for purposes of the county accredited register and the results of such sampling are utilised for purposes of "Grade A" licences, the cost is to be borne by the general county account, and that veterinary inspections required by the scheme are to be undertaken by the county veterinary inspector free of cost to the producer. These arrangements are to continue in force for the period ending March 31st, 1937.

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Whilst cutting up dead cattle, employees of Messrs. Mays (Ltd.), of Bourne, Lincolnshire, found a full-length spoke from a bicycle wheel lodged through the centre of a bullock's heart.

Notes and News

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

June 22nd.—Meeting of the Editorial Committee, N.V.M.A., at 2, Verulam Buildings, Gray's Inn, W.C.1, 4 p.m.

June 24th.—R.C.V.S. Committee Meetings.

June 24th.—Victoria Veterinary Benevolent Fund Council Meeting.

June 25th.—R.C.V.S. Committee Meetings.

June 26th.—R.C.V.S. Committee and Council Meetings.

June 27th.—Meeting of the North of England Division, N.V.M.A., at Newcastle-on-Tyne, 2.30 p.m.

June 29th.—R.C.V.S. Membership Examinations begin.

July 2nd.—R.C.V.S. Oral and Practical Examinations begin in London.

July 16th.—Annual Summer Meeting of the Lancashire Division, at Preston.

August 22nd.—Entries for Jubilee Memorial Bursary Examination.

Sept. 14th-18th.—N.V.M.A. Annual Congress, Scarborough.

Sept. 22nd, 23rd.—Jubilee Memorial Bursary Examination.

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SCARBOROUGH CONGRESS

Reduced Fares

The Railway Companies of Great Britain (except the Metropolitan and other lines of the London Passenger Transport Board) have agreed to issue tickets, as under, available for one calendar month from the date of issue, to passengers travelling to attend the Scarborough Congress of the Association.

Third-class, ordinary single fare and one-third for the double journey.

First-class fares in Great Britain, 50 per cent. over the third-class fares.

To secure the above concessions, vouchers (which will soon be available from the N.V.M.A. Offices) must be surrendered at the booking offices by the persons in whose favour the forms are issued.

The facilities will apply from all stations in Great Britain and Ireland and from the Irish ports by railway-owned steamers and the boats of the following independent steamship companies: Belfast Steamship Co., British and Irish Steam Packet Co., City of Cork Steam Packet Co., Burns and Laird Lines, Ltd.

The reduced fare vouchers will not, however, be available by Railway Air Services.

PERSONAL

Glasgow Veterinary College

Forthcoming Presentation to the Principal.—The committee in charge have now made arrangements for the presentation to be made in the College on Thursday, July 7th, at 3 p.m. They trust that as many subscribers as possible may find it convenient to be present.

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R.C.V.S. OBITUARY

Steel, James, 24, Derllwyn Road, Tondu, Aberkenfig, Glam. Graduated Glasgow, December 23rd, 1893; died June 10th, 1936, at the Prince of Wales Nursing Home, Cardiff.

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THE ACCIDENT TO LADY HOBDAY

At the West London Police Court on June 4th Mrs. J. E. Milne was found guilty on a charge of driving without due and proper care and attention on December 17th last in Kensington High Street and fined £10 and five guineas costs. The charge arose out of an accident in which Lady Elizabeth Hobday, the wife of Sir Frederick T. G. Hobday, C.M.G., the Dean and Principal of the Royal Veterinary College, was seriously injured.

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FREE STATE VETERINARY COUNCIL

At a meeting of the Veterinary Council (Saorstat Eireann), Mr. P. F. Dolan, as returning officer, reported that at the Council elections held on May 29th, he had declared Professor J. J. O'Connor elected as general elected member for four years, and Professor W. Kearney and Mr. A. F. O'Dea as limited elected members, also for a period of four years.

The meeting elected Mr. P. F. Dolan President of the Council, and Professor J. J. O'Connor Hon. Treasurer.

The following committees were appointed: Standing and Panel Cases Committee: Mr. A. A. Donnelly, Professor J. J. O'Connor, and the President. Finance Committee: Mr. A. A. Donnelly, Professor J. J. O'Connor and the President.

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SOCIETY OF VETERINARY OFFICERS

The annual meeting of the Society of Veterinary Officers was held at the Town Hall, Leeds, on Saturday last, when Major Brennan DeVine, Chief Veterinary Officer for Birmingham, was elected President.

The Society, which was formed in Leeds three years ago, consists of veterinary surgeons employed by county and municipal authorities. Eighty members attended the meeting on Saturday, which was presided over by Captain R. Simpson (Cumberland).

Discussions took place on the administration of the new Milk (Special Designations) Order, 1936, which has just come into force.

It was decided to hold the next annual meeting at Birmingham.

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IMPROVED MILK STANDARD

Dublin Medical Officer on Value of Veterinary Inspection

Under the above headings, the *Milk Trade Gazette* of June 13th reports that, giving evidence before the Local Government (Dublin) Tribunal recently, Dr. J. A. Harbison, the Dublin County Medical Officer of Health, said that in general he found that cowsheds and animals in the district were kept clean, and one of the great advantages of veterinary inspection was that cow-

keepers were being educated in the proper handling of milk. The result was that there was a much improved standard.

There were, he stated, 47 cowkeepers and 95 milk purveyors in Dun Laoghaire Borough, but there was a tendency for people to enter the milk business who could not afford it; and they went in with the idea of selling a quantity of milk at a price, and found that when they came under the supervision of the local authority they had neither the capital nor the equipment to carry on.

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TUBERCULOSIS ORDER DISCUSSED IN FIFE

Reports upon the measures taken to prevent tuberculosis in dairy herds in Fife raised criticism at a recent meeting of the Fife Public Health Committee. The reports were submitted by Mr. R. G. Anderson, County Veterinary Inspector, and Dr. G. Pratt Yule, County Medical Officer. In his report, Mr. Anderson stated, in reply to a question put at a previous meeting, that it was not possible with any degree of exactitude to state how long a case of tuberculosis of the udder might have existed before its recognition by himself. The majority of cows condemned for tuberculosis of the udder, he said, were animals in good condition and to all appearances in perfect health, and the evidence of the udder was slight and indefinite, so that the demonstration of tubercle bacilli in the milk was required for a positive diagnosis. He held the view that, while the voluntary establishment of tubercle-free herds went some little way, such small encouragement as local authorities might give was so negligible as to be ineffective.

In his report, Dr. G. Pratt Yule quoted the Tuberculosis Order of 1925, which provides for immediate notice being given to the local authority of cases of tuberculosis. He said that the Tuberculosis Order of 1925 furnished the statutory authority under which the County Veterinary Inspector acted in dealing with tuberculous cattle. Unfortunately the Order provided only for the condemnation and slaughter of cattle suffering from advanced tuberculosis. "The Tuberculosis Order," his report stated, "apart from the expense it entails, is in great measure useless for the control and prevention of the spread of tuberculosis in dairy cattle."

Bailie Fleming, Anstruther, criticised the report of the Medical Officer, and claimed that the Order had done some good. Bailie Fleming maintained that the Medical Officer's report was unfair.

Mr. Peter Ness, Lochgelly, pointed out that there were 408 registered and unregistered dairies throughout the county. During the past month the Veterinary Inspector had only been able to inspect 54 dairies, so that each dairy could only be inspected once every eight months.

It was agreed that the County Clerk should raise the matter with the Department of Agriculture.

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IMPROVEMENT OF INDIAN CATTLE

The first proposals of the campaign for the improvement of cattle have been outlined by the Viceroy in a letter to all the Provincial Governors, says *The Times* Correspondent from Simla.

"Lord Linlithgow states that he is anxious to initiate throughout India a sustained effort to attract that unofficial support for livestock improvement which is so essential to farming progress in every country, and asks the advice of the Governors and their agricultural experts on methods that may be used to achieve this end.

"He recognises that much has already been done by Provincial Governments in this field and that more would have been achieved had financial conditions been more favourable. He recalls that shortly after his assumption of office he presented three stud bulls to the cultivators of the Delhi district and made a general appeal to persons of wealth and position to follow his example elsewhere. This appeal has met with some success, and he has been impressed by the favourable attitude of the Indian Press and the fact that the donors have chiefly been drawn from smaller landowners and people of moderate means."

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FROM BEEF TO MILK PRODUCTION

Marketing Board Chairman on Threat to the Balance of Agriculture

In presenting, as Chairman, the report and accounts to the third annual general meeting of the Milk Marketing Board, Mr. T. Baxter said that the first outstanding fact revealed by the report was the increase of 78½ million gallons in the volume of milk sold and an increase of 4,106 in the number of contracts in operation, which reflected the continued confidence of producers in the security and stability which has been established for the industry by the Milk Marketing Scheme. The increase in gallonage obtained was due to the additional number of contracts registered, many of which were from producers who had not previously sold milk on the open market and who were engaged in stock-rearing and butter-making. The rise in sales must, therefore, be associated with the turnover from stock-raising and farm butter-making on farms to milk selling. The regular monthly cheque provided ready cash for these farmers, but the increased quantities of milk thus marketed must be manufactured on terms which depreciated the collective returns of producers.

Danger of Excessive Supplies

This tendency towards increasing supplies was, of course, a serious matter. The first result must be that the stock-raising and cattle-feeding areas were turning over to dairy farming, which must create a real problem in efforts to hold the balance of agriculture in this country. He could see a cumulative shortage in supplies of store cattle within a few years. He had no doubt that if the Government's long term policy for assisting the store cattle and beef producers had materialised these producers would have been encouraged to continue the traditional character of their farming. Much less milk would have been offered for sale and the Board would have been able to return to milk producers substantially better prices. No Milk Marketing Scheme could carry the burden of depression in British farming and continue to pay remunerative prices. He mentioned this question this year, as he did last year, in order that the Government should be pressed to fact the issue and prepare a permanent solution.

If there were to be any measure of price stability for milk producers in this country, there must be introduced into the scheme some method of relating price to sales realisation in the different markets by the introduction of a standard basic quantity of liquid sales for each producer. The ever-open door to all and sundry to market new supplies of milk on equal terms with those who had been milk producers for

many years was inequitable and dangerous. Eighteen months ago the Board produced a scheme for the regulation of sales on these lines. On advice it was referred to the Reorganisation Commission for Milk for Great Britain for their examination and report. The Board believed that such a scheme would prevent the gap between the pool price and the liquid price becoming wider; in fact, it would tend to become narrower. It would still enable those who wanted to produce milk beyond normal requirements of the market to do so, but as they would receive on such excess sales only the manufacturing price for that milk they would not injure those who kept their production down to more level proportions.

Success of the "Accredited" Scheme

At a later stage in his address Mr. Baxter said that he was hopeful that the funds of a levy subsidy would enable the Board to take effective steps to improve further the quality of the milk supply. Last year he was able to announce the introduction of the accredited scheme, and his hearers knew that it had been a phenomenal success. The Board had already no less than 16,000 milk producers who had become "accredited." Many of them had re-fashioned their buildings; many of them had brought piped water on to their cow-sheds and buildings; many of them had used sterilising plant for the first time, and many had improved their herds and their methods of production. He ventured to say that the accredited scheme had been a decisive step taken by the Board in the right direction. They hoped soon to bring into the scheme the tuberculin-tested producers, who would to some extent reap the fruits of their labours.

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LEGAL NOTES

Cattle Smuggling Prosecution: Ulster Judge's Criticism of Finance Act.—The Lord Chief Justice of Northern Ireland, Sir William Moore, declared in the Divisional Court, Belfast, on Monday last that Section 16 of the Finance Act, 1934, was a statutory invasion of the Common Law right of every traverser to see that the prosecutor proved his case against him.

The Court ordered the Loughgall, Co. Tyrone, magistrates to proceed according to law with the hearing of a Customs prosecution against Michael Haughey, a local farmer.

The Lord Chief Justice said that in July, 1934, Haughey was convicted by the Justices for being knowingly concerned in an attempted evasion of duty on cattle imported from the Irish Free State, but they agreed to state a case to the High Court with regard to the admission of a certificate submitted by the Commissioners of Customs and Excise.

This certificate, he said, was the principal evidence against Haughey, and it certified that the cattle of which he was alleged to have been in possession had also been found in the control or possession of two other people who had failed to furnish proof that the cattle had not been illegally imported.

The Lord Chief Justice said: "While Section 16 of the Finance Act is the law of the land this Court should be careful to see that all requirements imposed by statute before such charge comes into force have been complied with. Haughey was never required to explain his possession of the cattle and was not given an opportunity for such explanation. The onus of proof, therefore, rested on the prosecution."

Slaughtering Offence.—A warning to farmers was given at the Bulmer East Petty Sessions at York Castle, when a farmer pleaded guilty to failing to give notice to the local authority, the Flaxton Rural District Council, of the slaughter of animals for human consumption, and to using premises as a slaughterhouse without a licence. He was fined £2 and ordered to pay costs.

Tuberculosis Order Breach.—At Petersfield Petty Sessions, on June 4th, a Ramsdean farmer was fined £5, and ordered to pay 10s. 6d. costs for a breach of the Tuberculosis Order on May 22nd, at Langrish. The information in detail was that he owned a cow appearing to be suffering from tuberculosis, and did not inform a police constable or an inspector of the local authority. Defendant pleaded not guilty. Mr. M. E. White, M.R.C.V.S., inspector for the local authority, said he examined the cow and found it suffering from tuberculosis. The animal was slaughtered. The *post-mortem* showed that the disease was of long standing, but he did not think that until quite recently any definite symptoms had been showing. "The cow was dying of tuberculosis when I saw it," he added. The disease was acute for more than three months, and the animal was in an emaciated state.

A police officer said he asked defendant why he did not suspect that the cow was suffering from tuberculosis, and the latter replied that he had had no experience of these cases. In a statement defendant said he knew he should have reported the case, and that the cow had not been in very good condition. To his knowledge the cow had not been milked for three months. Mr. Geach, for defendant, emphasised the fact that the cow had slipped two calves early in May, and the cow was therefore not looking fit. The information said "appeared to be suffering." What did that mean? he asked. Appeared to whom? It did not appear to the defendant, or else he would have reported it.

The Chairman, observing that the charge was a very serious one, said that the defendant was liable to a fine of £50.

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Veterinarian's "Tests" for Fowl-run Raider.—Giving evidence in a case recently heard at Langport County Court, when a carter claimed £11 for damage suffered from the destruction of fowls by a "fierce and mischievous" dog, Mr. T. L. Whitby, M.R.C.V.S., of Taunton, said he gave tests to the suspected dog, which did not seem to take any notice of the poultry. He tried chasing the poultry to see if the dog did anything, but there was no reaction. He took the dog into the neighbour's poultry run, but again without result. He then went to see complainant's poultry, but the dog made no attempt to chase them. In the district he saw two other dogs which could have been mistaken for the suspected animal in the distance or by anyone not very observant of dogs. He did not think the dog killed the poultry.

In view of other evidence given, the judge said that he was satisfied as to the identity of the raider, and gave judgment for £9 5s. 0d. and costs.

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INCREASED DEFENCE FOR MOTORISTS

The Automobile Association has decided to extend its legal benefits to the protection of members and their drivers against the possibility of being charged with manslaughter in England

and Wales and equivalent charges in Scotland and Ireland. The Home Office statistics for the three years 1933-1935 show that whilst 364 motor drivers were charged with manslaughter 267 of that number were acquitted. This means that roughly three out of every four motorists charged with this grave offence have established the fact that they were innocent. To-day 90 per cent. of motorists are persons of moderate means to whom the heavy expense consequent upon a charge of this nature would be a serious matter. The legal costs in these cases can easily amount to three or four hundred pounds. In future, therefore, every member of the Automobile Association who is unfortunate enough to be involved in a charge of this character will be able to look to the A.A. for free defence, including the employment of experienced Counsel, at both police courts and sessions. In announcing this benefit the Automobile Association reserves to itself the right to refuse to undertake the defence of any member where, on investigation of all the circumstances, it is found to be against the public interest to do so.

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SIR FREDERICK HOBDAY ON THE PROVISION OF PROFESSIONAL SERVICES FOR SICK ANIMALS OF THE POOR

Addressing the annual meeting of the Alton, Haslemere, Petersfield and District Branch of the Royal Society for the Prevention of Cruelty to Animals, Professor Sir Frederick Hobday said that, as President of another animal humane society (the University of London Animal Welfare Society), and also as Principal and Dean of the Royal Veterinary College, it gave him much pleasure to accede to the invitation that had been extended to him to come there that day and support the liaison work which was being done to help the sick animals of the poor by the united efforts of the R.S.P.C.A. and the members of the veterinary profession. This combination of those who gathered the sick animals together, and those who by their qualifications were able to diagnose and treat their ailments—the veterinary surgeons—was the only way in which true charity and practical help could be rendered to animals belonging to owners who could not afford to pay and otherwise would not bring them along for treatment. The amateur was definitely not a fit and proper person to prescribe and administer remedies of which he knew nothing into bodies of which he knew less, and it was remarkable that in this animal-loving country of England there was no law to prevent this kind of experimental work, for that was really what it amounted to. Animals could not speak and protest as would a human patient if a doctor made a faulty diagnosis or gave him unnecessary pain, and they were entirely dependent upon their owners not only for the chance to be restored to health when ill, but also for a humane termination of their sufferings when all hope of recovery had gone.

He was pleased to know that four of his veterinary colleagues gave their earnest support to the good work accomplished by that branch, and one of his main objects in coming from London that afternoon was to tell them that the Council of the National Veterinary Medical Association collaborated most strenuously with the Council of the Royal Society for the Prevention of Cruelty to Animals in the free dispensary scheme which assured that the sick animals of the poor had the same proper veterinary advice and treatment as the animals of those who were well-to-do.

Correspondence

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The views expressed in letters addressed to the Editor represent the personal view of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

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SIR FREDERICK HOBDAY'S RETIREMENT

To the Editor of the Veterinary Record

Sir,—I have read with great regret the announcement of Sir Frederick Hobday's pending retirement and feel that the Governors of the Royal Veterinary College are making a great mistake in accepting the resignation of one who has done so much for the College. Without him the College would still be in the dilapidated state that it was for so many years. By his efforts and personality he has raised most of the funds to rebuild the College. I venture to suggest that no other man in England could have done what he has accomplished in such a short time. We of the veterinary profession look up to and admire him and we greatly deplore his retirement. If he has to go, let us see that a member of our profession is appointed to succeed him. The veterinary profession must be taught and guided by the veterinary profession.

Yours faithfully,
Frank Chambers.

Wolverhampton.
June 15th, 1936.

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To the Editor of the Veterinary Record

Sir,—We in this part of the world—Lancashire and Cheshire—are (as far as I can gather, without a solitary exception) grieved beyond measure to hear that Sir Frederick Hobday has decided to resign, and we sincerely trust that pressure may be brought to bear upon him to withdraw his resignation, or, if he cannot be so induced, that the Governors will decline to accept it.

Not merely those of us who were his fellow students, and the many others who, in the intervening years, have experienced his kindly care, but the whole profession recognise his outstanding ability, and the tremendous amount of successful work he has put in on our behalf, gratefully acknowledging that our present status is due more to him than to any other one veterinary surgeon.

We understand that increasing age is his excuse, but has it dulled his intellect, or impaired his physical or professional ability? I trow not, and we know full well that if he lives to accomplish a century he will retain, and evince, his enthusiasm for us as a body.

There are, undoubtedly, worthy successors to him to be found in our ranks, men equally competent in every way, but I doubt if one could be

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The horse on which Mr. J. Willoughby Gray, of Hertford College, Oxford, who was playing in the O.U.D.S. production of "As You Like It," was pacing up and down while awaiting a cue at a rehearsal in Magdalen College Grove on Monday afternoon came into contact with a cable under the turf and was killed by the shock. Mr. Gray was thrown clear. It is thought that the padding in the saddle saved him from the same fate as the horse.

found who holds the confidence, affection and esteem of his brother practitioners to such an extent as "Freddie" Hobday.

Please, Sir Frederick, stop with us!

Yours faithfully,
WARWICK FOWLE.

25, Oxton Road,
Birkenhead.
June 12th, 1936.

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RETENTION OF THE AFTERBIRTH IN THE MARE

TO THE EDITOR OF THE VETERINARY RECORD

Sir,—Major Heatley's article on this subject in yesterday's number of the *Veterinary Record* prompts me to make one or two comments, and as his article is for the use of the uninitiated I hope that he will forgive the criticism of a junior.

I note with interest his method of tying the tail and hope to find it useful. From his later notes, however, I rather think that his method of separation is not ideal, as he mentions shredding of the membrane. From this I imagine that Major Heatley detaches it with the tips of his fingers. A method which eliminates any chance of shredding, and one which I always practise, is to twist the membrane with the hand which is not inserted into the womb, or even get an assistant to do so. This will form the membrane into a thick cord, along and around which I pass my finger and thumb. When the attachment to the wall of the womb is reached, I squeeze the cord at this point, at the same time twisting it with the other hand. I find that separation takes place quite readily although slowly. However, all men of experience will agree, I think, that this is an operation in which extreme patience is essential.

I am one of those who think that douching is contra-indicated; in fact, I am of the opinion that however carefully it is carried out it is very dangerous, and it is my practice to insert one or even two 1 dr. iodoform gelatine pessaries, which I use with great success.

Whilst agreeing that it is essential to have a front foot tied up with some mares, I find that most will stand much more quietly on all fours, a foot being held up only at the start of the operation.

Yours faithfully,
T. J. MARGARSON, M.R.C.V.S.

Camden House,
London Road,
Stroud, Glos.
June 14th, 1936.

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CORRECTION

TO THE EDITOR OF THE VETERINARY RECORD

Sir,—In the issue of the *Veterinary Record* for June 13th, 1936, 48, 24, p. 757, I am reported as giving utterance to remarks of a very doubtful meaning with reference to the treatment of intestinal parasites of sheep with copper sulphate.

What I did say was to the effect that copper sulphate was of very limited value in the treatment of parasites other than the trichostrongyle *Haemonchus*.

Yours, etc.,
H. M. SALUSBURY.

Veterinary Department,
Corporation Abattoir,
Sheffield, 2.
June 15th, 1936.

The Editor acknowledges, with thanks, the receipt of the following:—

Communications from Dr. R. F. Montgomery and Mr. W. T. Rowlands (Bangor).

Report of a meeting of the Derbyshire Division, N.V.M.A., from Mr. W. J. Ironside, Hon. Secretary. Report of a meeting of the Lincolnshire and District Division, N.V.M.A., from Major F. L. Gooch, Hon. Secretary.

Diseases of Animals Acts

SUMMARY OF RETURNS

Period.	Anthrax.		Foot-and-Mouth Disease.		Parasitic§ Mange.		Sheep Scab.	Swine Fever.	
	Outbreaks confirmed.	Animals attacked.	Outbreaks confirmed.	Animals slaughtered as diseased or exposed to infection.	Outbreaks reported by the Local Authorities.	Animals attacked.	Outbreaks confirmed.	Outbreaks confirmed.	Swine slaughtered.
	No.	No.	No.	No.	No.	No.	No.	No.	No.
Period 16th to 31st May, 1936	24	25	—	—	4	7	4	93	87
Corresponding period in									
1935	20	27	—	—	2	4	2	90	40
1934	17	19	—	—	3	3	9	106	79
1933	10	10	2	189	1	1	9	121	80
Total 1st January to 31st May, 1936	237	280	4	379	68	203	135	933	663
Corresponding period in									
1935	187	210	32	10,111	64	97	178	753	355
1934	202	214	2	93	81	129	324	689	403
1933	153	173	56	5,350	90	163	197	665	346

NOTE.—The figures for the current year are approximate only.

§ Excluding outbreaks in Army Horses.